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Planning and Interactive Decision-Making in Expert Elementary Physical Education Teachers.

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PLANNING AND INTERACTIVE DECISION MAKING IN EXPERT ELEMENTARY PHYSICAL EDUCATION TEACHERS

A Dissertation
Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The School of Health, Physical Education, Recreation, and Dance

by

Deborah J. Howell
B. S. E. University of Southern Arkansas, 1969
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August 1987

DEDICATION

To my parents, Gillen and Bill Howell.

Although death took you from me too soon, your handiwork is still felt. I love you.

ACKNOWLEDGMENTS

I would like to thank the fourteen elementary physical education teachers (Bea, Bill, Butch, Carol, David, Don, Doris, Earnestine, Gayle, Kenneth, Lerline, Pat, Penny, and Val) for sharing with me your expertise and making this project successful and delightful.

Special thanks to Dr. Madge Ashy for your assistance and interest throughout this project and for so graciously giving me a home away from home. To Ed Walkwitz and Mary Nix, I couldn't have tested all those children nor filmed all those classes without your assistance, thank you. Thanks to Carol Poto and Karyn Nelson for your support and understanding. It is very much appreciated. Jo Carter, thanks for the cookies, milk and warm fuzzies.

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To Kathie Hayden for always being there day or night, good times or not so good times. You made this journey so much easier and I will forever be grateful. Drs. Greenockle and McPherson, I can't think of anybody that I would have rather gone through this with--we made it!

FOREWORD

This manuscript is written in the format of the American Psychological Association. The body of the manuscript is presented in the format of submission for publication to scholarly journals. The remaining sections constitute the appendix and consist of studies reviewed in preparation of this paper, pilot data, additional information concerning measurement instruments, planning transcript, stimulated recall interview, and additional tables.

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ABSTRACT

This paper describes the planning and interactive decision making used by expert elementary physical education teachers as they developed and taught a 5 day unit on basketball dribbling. Secondly, it explores the relation between teachers' planning productivity (number of statements made) and student achievement. Expert elementary physical education teachers (N=11) provided information regarding their thought processes during planning and interactive decision making. Planning sessions were conducted prior to each lesson with teachers using the "think aloud" technique. All instructional lessons were videotaped. Following each of the first three lessons, teachers were shown a videotape of the lesson and were interviewed regarding their thoughts and decision making strategies used during teaching. Students' performance on the AAHPERD Control Dribble Test was used as an indicator of achievement. Students were tested prior to and after the 5 day instructional unit. Results indicated that when planning, the dominant focus of expert teachers was the development of activities. Further, activities rather than formal objectives appear to be the basic unit of instruction by which teachers organize the lesson. During teaching expert teachers were primarily concerned with students' performance. Expert teachers appear to use student behavior cues as the major indication to alter the lesson suggesting that antecedents of alternative actions are content and situation specific. In addition, expert teachers used the class as the focal point

when adjusting the original teaching plan. Results from the control dribble test indicated that girls and boys improved significantly in their dribbling skill during the 5 day unit. However, the relation between teacher productivity and student achievement was not significant.

Introduction

Much research has been conducted to identify teaching practices that positively influence student learning. Researchers have systematically observed classroom process in an attempt to build relations between the overt actions of the teacher and student achievement.

Recently, researchers have offered a new framework for investigating teaching effectiveness. This line of research seeks to understand how teachers cope with the realities of a classroom by asking, "Why successful teachers do what they do?" An assumption is that teachers' overt behaviors are influenced and determined by what teachers think. Within this framework teachers have been described as clinical information processors (Shulman & Elstein, 1975), planners (Yinger, 1978), and decision makers (Clark & Joyce, 1981; Shalverson, 1973).

Research on teachers' thought processes has concentrated on three categories of teacher cognition: (a) preactive planning, (b) interactive decision making, and (c) teacher theory and belief. The first two categories represent a temporal distinction between teacher thought processes occurring prior to teaching (preactive) or during teaching (interactive). The third category examines the influence of teachers' theories and beliefs on planning and decision making. While research in each of these categories has contributed to the development of the teacher cognition framework, the present study focuses on the preactive and

interactive phases.

Classroom Research on Teachers' Thought Processes

The majority of literature on preactive planning has been conducted by educational researchers within classroom settings (Clark & Joyce, 1981; Clark & Peterson, 1981; Clark & Yinger, 1979; Joyce, 1981; Peterson & Clark, 1978). One major goal of this research has been to create models that describe the planning process. The traditional model for teacher planning generally used at all levels of education was proposed by Tyler (1950). This linear model consists of four essential steps in the planning process: (a) specify objectives, (b) select learning activities, (c) organize learning activities, and (d) specify evaluation procedures. However, research has consistently shown that teachers' primary focus during preactive planning is on the selection of instructional tasks and activities rather than determining objectives or evaluating students (Borko, Cone, Russo, & Shalverson, 1979; Marx & Peterson, 1981; Peterson, Marx, & Clark, 1978; Popham & Baker, 1970). Additionally, findings have indicated that the inclusion of activities within a lesson are apparently made on the basis of their ability to involve optimal participation from the maximal number of students (Clark & Joyce, 1981; Clark & Peterson, 1981; Marx & Peterson, 1981).

While research in preactive planning concentrates on teachers' thought processes prior to teaching, research in interactive decision making focuses on the thought processes

that occur during teaching. Specifically, the content of teachers' thoughts has been described and more recently the salient cues that initiate teacher decisions have been studied. Clark and Peterson (1986) compared the findings from several studies and concluded that (a) a relatively small portion of teachers report interactive thoughts addressing instructional objectives, (b) a relatively small percentage of teachers' statements about interactive thoughts addressed subject matter (c) a large percentage of teachers report focusing on instructional processes including instructional procedures and strategies, and (d) the largest percentage of teachers report interactive thoughts concerning the learner.

While some researchers have attempted to identify the thoughts of teachers during a teaching episode, other researchers have attempted to identify interactive decisions. An interactive decision was defined by Marland (1977) as a conscious choice which included three components: (a) explicit reference to consideration of alternatives, (b) evidence that the teacher made a selection and committed to one of the alternatives, and (c) evidence that the teacher followed through in the lesson with that choice of alternatives. These interactive decisions which result in changes in the lesson have been referred to in the literature as interactive decisions, alternative strategies or alternative actions. The study of alternative courses of action taken by teachers has resulted in the formulation of

three research questions. First, when and how often do teachers implement alternative strategies? Second, what types of actions are implemented, and third, what serves as antecedents of alternative strategies? Research has indicated that alternative strategies are rarely implemented unless the lesson is judged as going poorly (Clark & Yinger, 1979; Joyce, 1981; Morine-Dershimer, & Vallance, 1976). Additionally, the primary cues used in determining the success of a task or activity were student cooperation and participation (Joyce, 1981; Peterson & Clark, 1978). Thus optimizing instruction was not identified as a priority of teachers. Even with variations in methodology, studies have shown that the frequency of alternative strategies is similar across time. On the average teachers made one instructional decision every 2 minutes (for a review see Clark & Peterson, 1986).

Research designed to identify the types of actions implemented has shown that alternative strategies range from minor to major adjustments in the lesson (Sherman, 1982). The strategies implemented may involve changes in an activity, instructional processes, or organization and management.

Finally, three types of cues have been identified as antecedents of alternative strategies: (a) teacher generated (e.g., selection of respondent, modifications in content or sequencing material), (b) contextual factors (e.g., time, environment), and (c) student behavior cues (e.g., observation and assessment of student behavior). General findings

indicate that while interactive decisions occur in response to student behavior, the majority of alternative strategies were related to the appropriateness of the material or contextual cues. (Fogarty, Wang, Creek, 1982; Marland, 1977; Wodlinger, 1980).

Beyond identifying the focus of teachers during the preactive and interactive stage, a few researchers have examined the stability of planning patterns across the lesson of an instructional unit. Initial results have shown that productivity (number of codes from a lesson) decreased after the initial lesson (Marx & Peterson, 1981). Because research on teaching is designed to eventually identify behaviors of effective teachers, some researchers have examined the relation of teachers' planning and/or interactive decision making to student achievement (Doyle, 1977; Morine & Vallance, 1975; Peterson & Clark, 1978). Although the measures of achievement varied, findings have shown that teachers who monitor class situations carefully and intervene early (alternative action) when students' behaviors are not within tolerance tend to be more effective teachers. That is, their students achieved more.

Research on Teacher Planning and Interaction Decision Making In Physical Education

During the brief history of research on teachers' thought processes, noteworthy contributions to the literature have been made by physical educators. Metzler and Young (1984)

compared the effects of lesson plans designed by an expert and novice physical education teacher; the results showed that the divergent planning styles of the two teachers significantly affected students' academic learning time in physical education (ALT-PE). In support of the importance of preactive planning, Twardy and Yerg (1986) reported relations between teacher planning behaviors and the inclass behaviors of teachers and learners in a 30 minute lesson on the volleyball spike.

An expert-novice paradigm has been used by several researchers (Housner & Griffey, 1985; Sherman, Sipp, & Taheri, in press) to study planning and decision making in physical education. In general, findings indicate that expert-novice differences in planning are due to variations in knowledge of specific pedagogical situations. For example, the productivity level of the experienced teachers in Housner and Griffey's study was substantially more than inexperienced teachers with a marked difference noted for instructional strategy decisions (i.e., management, assessment, demonstration, student focus). Thus, experienced teachers attended to the implementation of learning activities as well as the subject matter content. Further, experienced teachers differed from novice teachers in terms of the cues initiating alternative actions during the interactive phase of teaching. The initiated alternative actions of experienced teachers were responses to student performance; whereas,

inexperienced teachers' actions were stimulated by class interest and student cooperation. While these studies have provided a rich beginning for the study and subsequent understanding of teacher thought process, there are several questions still unanswered. The studies to date have been conducted in laboratory settings rather than the natural environment encountered in the gymnasium. Little is known concerning how expert teachers in a public school environment plan and make interactive decisions. Teachers in the previous studies have instructed students unknown to them prior to the study. One could argue that the planning and interactive behaviors of teachers might be influenced by more complete knowledge of student characteristics. Further the class size of past studies ranged from four to eight students. Certainly planning and managing a full class would involve different thoughts and decisions. In an interview conducted by Graham (1981) Locke and Siedentop have noted that in many instances findings from studies conducted in a laboratory setting may not be ecologically valid for a natural classroom setting and suggest further validation. Therefore, the general intent of the present study was to describe the planning and interactive decision making of expert elementary physical education teachers within the gymnasium. Specifically, the purposes of the study were:

1. To describe the focus of planning decisions made by expert teachers;

2. To examine the stability of planning productivity across the lessons of the instructional unit;
3. To describe the cues that expert teachers attend to during teaching;
4. To identify the antecedents of alternative strategies and the actions implemented by teachers;
5. To examine the relation between planning productivity and student achievement.

To answer these research questions, 11 expert elementary physical education teachers were asked to provide information relating to their thought processes during preactive planning and interactive decision making. Each teacher taught a 5 day unit on basketball dribbling. Prior to teaching each lesson, a planning session was conducted and teachers were audiotaped while planning their lessons aloud (think aloud technique). Similarly, after each of the first three lessons, teachers were interviewed regarding their thought processes during the teaching episode.

Method

Subjects

Eleven elementary physical education teachers (6 females and 5 males) employed by the East Baton Rouge Parish Schools served as subjects for the study. The subjects' teaching experience ranged from 10 to 21 years (mean experience = 15 years). The selection of these teachers was made by the

director of physical education for East Baton Rouge Parish schools from a subject pool of 40 elementary physical education teachers. Criteria of selection were yearly evaluations by the physical education supervisor. Each of these teachers had received an excellent rating. Several have been nominated for outstanding teacher of the year and three have been recognized by the community as outstanding teachers. Eight of the 11 teachers have a master's degree. Learner subjects for the study were 278 fifth graders (137 females and 141 males) from intact physical education classes (one class per teacher). Ninety three percent of the girls (124 of 134) and 82% (113 of 141) of the boys had not participated in an organized basketball program. Intact classes were randomly chosen from each teacher's fifth grade sections. Informed consent was obtained from the teachers, students, and parents of the students.

Skill Test

The Control Dribble Test was chosen from the AAHPERD Basketball Skill Test (Hopkins, Shick, & Plack, 1984) to evaluate dribbling skill. This test has been shown to be a valid and reliable measure of basketball skill using a standard size ball (r = .95 for girls and boys) (Hopkins, Shick, & Plack, 1984) and women size ball (r = .97 for boys and r = .93 for girls) (Howell, Ashy, & Walkwitz, 1986). The control dribble test was administered prior to and again at the conclusion of the 5 day instructional unit. The test

required students to dribble the ball through a specified pattern while weaving around cones. The purpose of the test was to measure ball handling skill while the body is moving. Procedures outlined in the AAHPERD Basketball Skill Test Manual were followed. All skill testing was conducted by the investigator and two trained assistants. Students' scores for the pretest were recorded from fastest to the slowest according to gender and given to teachers prior to the initial planning session.

Procedures

Sequencing of Sessions

The study required that teachers participate in two orientation sessions prior to the initiation of the study. The first session involved a brief overview of the study followed by videotaping the teacher and students participating in their regularly scheduled activity. The next two sessions were devoted to pretesting students on the control dribble test. The instructional unit on dribbling was implemented during sessions 3 through 8. All instructional lessons were videotaped using a Sony 8 mm camera-recorder. Because the focus of the study was interactive decision making, the teacher was kept in view at all times. The final two sessions of the study were used to posttest students on the control dribble test.

Teacher Orientation

Two orientation sessions for teachers were conducted

prior to the initiation of the study. During the first session, a brief overview of the study was given and teachers completed a questionnaire designed to gather general biographical information (e.g., years' teaching experience, highest educational degree, honors and awards). A second meeting with each teacher was scheduled one week prior to the initiation of the instructional unit. During this meeting, teachers listened to a sample think aloud tape demonstrating teacher planning. The think aloud technique has been used effectively to examine the thought processes of physicists (Chi, Feltovicher & Glasser, 1981), chess players (DeGroot, 1965), classroom teachers (Marx & Peterson, 1981), and physical education teachers (Housner & Griffey, 1985). Planning statements on the sample tape were scripted to illustrate a variety of features that teachers could address in preparing a lesson. After listening to the sample tape, teachers were given written guidelines outlining the objective of the instructional unit, available equipment, procedural formats for planning sessions, instructional lessons, and recall interviews. Additionally, teachers were given a packet of instructional materials (skill analysis of dribbling, suggested skills, drills, and leadup activities) that could be used during the instructional unit.

Student Orientation

One week prior to the initiation of the instructional unit, an orientation meeting for fifth grade students was held

during the regularly scheduled physical education class. After a brief overview of the study, the investigator videotaped the teacher and students participating in their regularly scheduled activities. This session provided an opportunity for both the teacher and students to adjust to the presence of the investigator and the camera.

Preactive Planning Sessions

Planning sessions (45 minutes maximum) with teachers using the think aloud technique were conducted prior to each instructional lesson. The teachers' verbalizations were audiotaped and transcribed verbatim. Standardized instructional materials (skill analysis, skill variations, drills, leadup games) and results of the control dribble pretest were available for use during the planning session.

Instructional Unit

Five 20 minute lessons on dribbling were conducted by each teacher participating in the study. The investigator signalled the teacher to begin each lesson and notified the teacher when 2 minutes remained in the lesson. Lessons were conducted on a standard size outdoor basketball court. In case of inclement weather, teachers conducted the lesson in an indoor gym/auditorium. While equipment, time and space allocations were standardized, each teacher was free to present the instructional unit in any manner chosen with the exception of two stipulations. First, no plan could be repeated in its entirety. Second, if task cards or other

individualized approaches to teaching were used, the entire unit should adhere to the same format.

Interactive Recall Interview

Following three of the five lessons (lessons 1, 2, 3) teachers participated in a stimulated recall interview (Bloom, 1954; Kagan, Karthjowhl, Golberg, & Campbell, 1967). During the interview teachers viewed one 4 minute and eight 2 minute video segments of their teaching presented in sequential order. Following each segment, teachers responded to a series of structured interview questions designed to stimulate recall of thought processes occurring during the interactive teaching phase. The length of the viewing segments was based on pilot work and the frequency of decision making reported in classroom research (Clark & Peterson, 1986). The interview questions were: (a) What are you doing in this segment and why? (b) Were you thinking of any alternative actions or strategies at that time? (c) Did you have any particular objectives in mind during the segment? If so, what were they? (d) What were you noticing about the students? (e) How were the students responding? (f) Did any students' actions or reactions cause you to act differently than you had planned? (g) Do you remember thinking about any other aspects during this segment such as the time remaining in the lesson, the time this segment required, or anything else that affected your decisions? An additional question regarding teachers 14 having off task thoughts was then asked and teachers responses

were recorded. Each recall interview was audiotaped and transcribed verbatim for future analysis. Recall interviews lasted approximately 1 hour.

Coding Instrument for Preactive Planning

The preactive planning tapes of the teachers were transcribed verbatim and coded using a modification of a coding system designed by Housner and Griffey (1985). The modification included an additional subcategory for objectives within the instructional decision category. The coding system consisted of task/activity decisions and instructional strategy decisions. Task/activity decisions were classified into five subcategories: (a) structure-- decisions regarding the general type of activity to be used, (b) procedures--specific decisions about the procedural details used in performing an activity, (c) formations-- decisions about the spatial organization of the activity used in the performance of a task, (d) time--decisions about the allocation of time to activities, (e) adaptations--contingency decisions about activities that will be used only if certain circumstances arise. Instructional strategy decisions were classified into eight subcategories: (a) management-- decisions regarding setting rules, establishing rapport and motivating students, (b) observation/assessment/feedback-- decisions regarding observing, assessing and providing instructional feedback to students, (c) demonstrations-- decisions to demonstrate motor skills for students, (d)

focusing student attention--decisions about specific aspects of the motor skill that should be brought to the students' attention, (e) verbal instruction--decisions pertaining to explanations, discussions, or questions that will be used in the lesson, (f) equipment--decisions about the equipment to to be used, (g) time--decisions about the allocation of time to specific instructional strategies, and (h) objectives--decisions showing the use of objectives. The coding decision log for preactive planning is presented in Table 1.

Insert Table 1 about here

Coding Instrument for Interactive Decision Making

Teacher responses to the recall interview were coded using a system designed by Housner and Griffey (1985). The system consists of two categories for coding teacher decisions--student behavior cues and teacher context cues. Student behavior cues were classified into eight subcategories: (a) performance--student cognitive or psychomotor performance, (b) involvement--student on task behavior, (c) interest--student interest or enjoyment, (d) verbalizations/requests--student statements, questions or requests, (e) effort--student effort in regard to performance, (f) mood/feeling--student mood, attitude, and feelings, (g) interactions--student interactions or relations with other students, and (h) other. Teacher context cues were classified into four subcategories: (a)

instructional behavior--behaviors exhibited by the teacher such as demonstrating, observing, assessing, giving feedback, (b) mood/feeling--the mood, attitude, or feeling of the teacher, (c) time--the time remaining in the lesson, the time a particular task required, and (d) equipment/facility. The decision log for coding the interactive data is presented in Table 2.

Insert Table 2 about here

Training of Coders

The training process was identical for coding teacher planning statements and interactive decision making statements of teachers. Prior to the coding of data, several training sessions were held. Two coders, one of them the investigator, were trained to code statements. A written coding log with general coding guidelines, behavioral definitions and examples of each category and subcategory were provided beforehand. The coders read a written transcript of teacher statements and discussed the subcategories as they occurred. Each coder then analyzed a preselected transcript from a previously conducted pilot study. This procedure was repeated until inter-coder reliability of .90 for the instrument and categories was obtained. The reliability of the subcategories ranged from .85 to 1.0. Inter-coder reliability was calculated using the general agreement-disagreement formula. During the course of

data analysis, inter-coder reliability checks were conducted on 20 percent of the planning and interactive transcripts (6 of 33).

Results

Skill Test

An 11 X 2 (classes X gender) ANOVA to assess skill differences prior to the start of the instructional unit revealed no significant differences between the classes $F(10,1) = 1.52$, $p = .25$. However, as expected significant differences between gender did exist, $F(10,1) = 46.75$, $p = .001$, with boys ($M = 22.50$, $S = 1.41$) achieving faster times than girls ($M = 28.77$, $S = 2.56$).

To measure the improvement in dribbling a pre-post design was used. Two dependent t tests were conducted. Both girls and boys showed significant improvement ($p < .05$) on the control dribble test, t (10) = 7.68 for girls (28.77 vs. 25.26) and t (10) = 4.66 for boys (22.5 vs. 21.0).

Focus of Planning Statements

The focus of teacher planning is described in Table 3.

Insert Table 3 about here

Global inspection reveals that the majority of teachers' planning statements for the instructional unit were task/activity statements. Closer examination indicates that teachers focused on structure (27.0%), procedures (19.5%), and

student focus (16.8%). The structure of lessons in terms of activities was similar among teachers. All teachers used drills that that were stationary, fluid, and required students to dribble around stationary and moving obstacles (partners). Additionally, all teachers included game-like activities in their lessons. While relays were used, the teachers' purpose was not to improve skill but rather as a contingency activity to motivate students to learn other skills or as a reward for working hard during the lesson. An example of this can be seen in the following excerpt from one teacher's transcript. "I was thinking in terms of racing now--letting them have some fun. I don't think it adds to the lesson, well to their skill, but I was thinking about--they were looking pretty good at this point and maybe next time around they could do it if we didn't have any major problems."

Further, teachers used extending and refining activities which gradually increased the complexity of the task. Task (e.g., dominant/non-dominant hand) and environmental (e.g., speed and direction) factors were varied. Similar findings have been reported by Housner and Griffey (1985).

The second dominant factor that teachers attended to was procedures (19.5%). They were explicit in developing procedures for class activities. Procedural statements included directions for organizing students for the activity, placing students in particular groupings, and consideration of the formations used in relation to the teacher's ability to

monitor skills and provide corrective feedback. These teachers seem to be visually/spatially oriented in developing their mental image of what would occur. This specificity is probably attributable to the fact that teachers in a natural environment must be able to manage large numbers of students in order to disseminate information.

The third factor most frequently attended to by expert teachers was student focus (16.8%) within the instructional decision category. Expert teachers typically analyzed skills, anticipated errors, and generated teaching cues to assist in improving student performance.

One feature of the planning phase that has received attention in the literature is the use of objectives. (Joyce, 1981; Peterson, Marx & Clark, 1978). While each teacher verbalized at least one objective per lesson, 10 of the 11 teachers did not begin their planning with objectives. Instead planning began with the content to be taught followed by the procedures for executing the activity. This finding lends support to the notion that activities are the basic unit of planning (Yinger, 1979). Additionally, the objectives reported were in broad terms and generally did not include a criteria of success. However, note that two of the 11 teachers used a steering group to judge success of activities. The first teacher reported using 50% of the class while the second used 75% of the class as an indication that mastery of a skill had been achieved.

The other features of planning (e.g., demonstrations, transitions, management, objectives) were not salient factors focused on by expert teachers during planning; at least as reflected by the percentages these teachers relegated to them. These results support previous findings by Housner and Griffey (1985).

Planning Productivity

Further inspection of Table 3 shows that planning productivity was highest for lesson one and decreased with subsequent lessons. This result corroborates previous findings from classroom literature (Marx & Peterson, 1981). However, individual productivity patterns varied among the 11 teachers. Three distinct planning patterns emerged from the data. Eight of the 11 teachers followed the predominant pattern showing a decrease in planning statements for each lesson after the initial lesson. Two teachers showed a decrease from lesson one to lesson two but an increase from lesson two to three. One teacher showed an increase in planning productivity with each successive lesson. With the exception of this teacher, individual planning productivity decreased after the initial planning session.

Stability of individual teachers' planning across the three lessons was analyzed using intraclass correlation. The overall stability estimate for lessons 1 through 3 revealed a significant difference between the lessons $F(10,2) = 22.7$, $p < .01$. Means and standard deviations for the three lessons

were: lesson one, M = 83.9, S = 41.8; lesson two, M = 58.0, S = 33.74; lesson three, M = 48.0, S = 27.5. Because lesson one was significantly different from the other two lessons, lesson one was eliminated from the analysis and stability was recalculated between lessons two and three (Thomas & Nelson, 1985). The resulting intraclass correlation coefficient was R = .90.

Focus of Interactive Decision Making

Table 4 summarizes the cues on which the 11 expert teachers focused their attention while teaching. The results show that the majority of teachers' attention was allocated to students' performance (49.8%) followed by involvement (18.6%). These findings are consistent with previously reported results.

Insert Table 4 about here

The other factors did not seem to play an important role in the focus of teachers during the interactive phase. These findings corroborate previous results by Housner and Griffey (1985).

Interactive Decisions Made

The type of cues that resulted in teachers implementing alternative actions during a lesson are presented in Table 5.

Insert Table 5 about here

Teachers in this study implemented 98 of the 138 alternative actions considered. The average number of decisions implemented per lesson was two. Of the 98 implemented strategies, 84% resulted from student behavior cues while 16% were the result of teacher context factors. The present findings are consistent with results reported by Housner and Griffey (1985); however, they differ from classroom findings which report teacher context cues as the primary antecedent of interactive decisions (Fogarty et al., 1982; Marland, 1980).

A further analysis of the interactive decisions made revealed that teachers directed 69% of their attention to the class, with group next (23.5%), followed by the individual (7.5%). These findings differ from those of Housner and Griffey (1985) who reported that the individual was the primary focus of attention.

Within the focus category, the desirability (positive, negative, neutral) of cues used by teachers to initiate alternative actions was examined. Results are presented in Table 6. Negative cues predominated, which

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Insert Table 6 about here

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supports classroom research (Clark & Joyce, 1975; Joyce, 1981) and the results in the physical education literature (Housner & Griffey, 1985). However, present findings failed to support the wide use of positive cues in initiating alternative actions reported by Housner and Griffey (1985). Teachers in this study reported only seven positive cues as antecedents of alternative actions.

Descriptions of the alternative actions (changes) implemented by teachers are shown in Table 7.

Insert Table 7 about here

The alternative actions implemented were tactical decisions regarding the activity, instructional processes or management. Changes in activities accounted for 38% of the interactive decisions made by teachers. This finding is similar to results reported by Housner and Griffey (1985). However, the percentage for instructional behaviors and management for the present study differed considerably from Housner and Griffey's findings. The percentage of changes relating to instructional process was much higher in the present study (33% vs. 19%), while the percentage for management was much lower in the present study (29% vs. 47.5%) compared to Housner and Grieffey's results (1985).

Relation between teacher productivity and student achievement.

Using the class as the unit of analysis, the relation between teachers' planning productivity and student achievement on the control dribble posttest was calculated using the Pearson product moment correlation statistic. The analysis revealed a moderate but not significant correlation for girls (r = .40, p = .22) and for boys (r = .30, p = .36).

Discussion

The general purpose of this study was to describe the planning and interactive decision making process used by expert elementary physical education teachers within the natural setting of the gymnasium. A secondary purpose was to determine the relation between planning productivity and student achievement as measured by the AAHPERD Control Dribble Test.

Results show many similarities between the planning and interactive decision making of expert teachers regardless of the setting (gymnasium vs. laboratory) or content (classroom vs. gymnasium). However, the antecedents of alternative actions and the focus of attention in implementing changes appear to be situation and content specific.

The finding that the content of teachers' interactive thoughts was concerned with student behavior cues corroborates previous work in physical education (Housner & Griffey, 1985) and classroom research (Clark & Peterson, 1986). However,

student behavior cues also served as the dominant antecedent for teachers implementing changes during lessons. While this result supports previous findings in physical education (Housner & Griffey, 1985), it conflicts with findings reported in classroom studies (Fogarty, et al., 1982; Marland, 1977; Wodlinger, 1980). In a recent review, Clark and Peterson (1986) suggest that the uncharacteristically high percentage of student behavior cues reported by Housner and Griffey (1985) probably reflects the questioning format of the recall interview. This explanation was tested in the present study by including questions addressing both student behavior and contextual factors in the recall interview. Teachers in this study, responded "No" 64% of the time when questioned whether students reactions caused them to alter their teaching plan. This finding provides more conclusive evidence that the difference between physical education and classroom teachers is not an artifact of the coding instrument. Rather the antecedents of teachers' interactive decisions appear to be content and situation specific. The physical education class is usually perceived as a more open environment allowing greater freedom to make adjustments in spatial relationships. Students are simultaneously engaged in activity with performance evaluated by varying degrees of correctness. Therefore, the focus of the teacher must be directed toward students and student performance if skill development is to be realized. On the other hand, students in the classroom are

primarily engaged in cognitive tasks. Their performance is frequently measured in terms of a by-product separate from the execution of the task. Moreover, the tasks measured are generally judged on an absolute scale of correct or incorrect. In addition the setting of the classroom is generally a small enclosed environment with students seated in desks and movement somewhat restricted.

Two findings of the present study that differ from previous research may be related to the setting (laboratory vs. natural environment). Class cues resulted in more instructional changes for the expert teachers in this study which is in contrast to previous work in physical education (Housner & Griffey, 1985). Most changes occurred in response to an individual cue in the Housner and Griffey study. One obvious reason for this difference in focus may be class size. In the present study, class size ranged from 20 to 28 students compared to 4 students in the laboratory study conducted by Housner and Griffey (1985).

Similarly the types of changes implemented by teachers may be related to class size. While expert teachers in this study tended to prolong activities, experienced teachers in the Housner and Griffey study were more likely to shorten or restructure activities. Because teachers' alternative actions occurred in response to student performance, it seems reasonable that the decision to extend activities would provide students of varying skill level more opportunity to

achieve. On the other hand, a controlled laboratory setting with only a few students provides the opportunity to give more individual attention to students. This may result in a faster paced lesson.

A relatively small frequency of management decisions was reported by teachers in this study. In contrast, Housner and Griffey found that approximately 50% of the interactive decisions made by experienced teachers were related to management. A possible explanation for this difference might reflect the fact that teachers in this study were teaching students in one of their regularly scheduled classes. Thus, one would expect that management routines and parameters of acceptable behavior had already been established.

In support of previous findings (Housner & Griffey, 1985; Joyce, 1981) teachers implemented interactive decisions in response to negative cues. One explanation for this occurrence is teachers only report implementing alternative actions when something deviates from their mental image devised during planning or when no routine is available (Parker & Gehrke, 1986). This notion might also account for the low incidence of positive cues used to generate changes in the lesson reported in this study and previous classroom literature.

Previous researchers who have studied planning have noted that teachers do not concentrate on formal objectives or evaluation of learners (Doyle, 1983; Jackson, 1968; Yinger,

1979; Zahorik, 1975). These researchers suggest that the widely accepted curriculum model advanced by Tyler (1950) and generally used in teacher preparation courses is not used by teachers in the classroom. The findings here strengthen this notion. In addition, Doyle (1983) and Yinger (1978) suggest that task/activity is the organizing point of teacher planning rather than the objective. Data from the interactive interviews in this study lend support to this idea. When questioned whether teachers had objectives for a particular segment of the lesson, these teachers responded that the objective was to execute the particular activity in progress; thus objectives are equated with activities.

While the decrease in productivity across the lessons in the instructional unit was expected, it may be attributed to two factors. First, teachers may have been overly conscientious in using the think-aloud technique during the first planning session. This effect has been previously suggested by Marx and Peterson (1978). Second, the decrease may be attributed to the instructional format used by teachers in this study. In lessons two and three, 9 of the 11 teachers used the initial portion of the lesson to review material previously covered. Thus, fewer and less detailed planning statements for the review portion were made.

Although the relation between teacher planning and student achievement was not significant, the strength of this relation might suggest that teachers who plan more detailed

lessons are more likely to produce achievement gains in students. The significance of the relations was probably affected by the size of the sample as well as the expertise of the teachers. Including novice teachers in the design would likely strengthen the relation.

From these results, the overall profile of an expert teacher is characterized by one who possess not only content knowledge (i.e., plans activities, analyzes skill, sequences material progressively) but also has procedural knowledge (knows how to implement) and conditional knowledge (when to implement and for what reasons). This profile is very different from that of the novice teacher described by Housner and Griffey (1985). The novice seems to focus on involvement, interest and effort of students which echoes sentiments of the busy, happy, good concept suggested by Placek (1982).

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Table 1. Decision Log for Preactive Coding Instrument

To Identify Subcategories	
If the Statement	Then Record
1. concerns: (a) skill (b) drill (c) activity	"Structure"
2. concerns: organizational procedures for an activity (e.g., assign partners)	"Procedures"
3. concerns particular class arrangements (e.g., circle, line, etc.)	"Formations"
4. refers to time in either (a) minutes required (b) number of repetitions	"Time"
5. restricts a particular task/activity to be performed only when certain conditions are met (e.g., if everyone catches on to this drill, then	"Task Adaptation"

Table 1 continued

	add the second part)	
6.	concerns: (a) setting rules (b) motivating students (c) improving rapport with students	"Management"
7.	concerns: (a) observing or monitoring students (b) assessing student performance (c) administering feedback	"Observation/ Assessment/ Feedback "
8.	concerns: (a) teacher demonstration (b) student demonstration (c) multiple demonstrations	"Demonstration"
9.	concerns: (a) moving students from one activity to another (b) indicating a particular activity to be used to move students from one activity to the next	"Transitions"
10.	concerns: (a) teacher initiated	"Verbal Instruction"

Table 1 continued

	instructions on an activity (e.g., telling, explaining)	
11.	concerns: (a) a particular aspect of the motor skill (b) skill analysis	"Student Focus"
12.	concerns: the amount of instructional time allocated for a particular instructional process	"Instructional Time"
13.	concerns: (a) distribution of equipment (b) retrieval of equipment	"Equipment"
14.	concerns: (a) teacher objectives (b) student objectives	"Objectives"

Within Each Subcategory

If the statement	Then Record
1. repeats an explanation of a particular statement (e.g., we'll dribble with the dominant and non-dominant hand--	Only the initial planning statement

Table 1 continued

yes, dominant first then the non-dominant)	
2. lists separate thought units (e.g., we'll do the figure eight and cross over drills)	A code for each separate unit of thought
3. list several cues that are in reference to the same thought (e.g., they need to look up, not look down at the ball)	One code in the appropriate subcategory

Table 2. Decision Log for Interactive Coding Instrument

To Identify Subcategories	
If the Statement	Then Record
1. concerns: (a) psychomotor performance (b) cognitive performance (e.g., they were doing the left hand dribble)	"Performance"
2. concerns: (a) on task (b) following directions (c) paying attention (e.g., they were listening, seem to be paying attention)	"Involvement"
3. concerns: (a) showing enjoyment (b) showing dislike (c) showing boredom (e.g., they were eager to do the activity)	"Interest"
4. concerns: (a) trying/not trying to execute an activity	"Effort"

Table 2 continued

5.	concerns: (a) student request (b) questions (e.g., Can we race just once?)	"Verbalization"
6.	concerns: any attitude, feeling, or mood (e.g., they were disappointed that we didn't race)	"Mood"
7.	concerns: (a) relations within individuals (b) relations between groups (c) relations within the class (e.g., the two girls were arguing over the ball)	"Interactions"
8.	concerns: any occurrence not directly related to any of the the subcategories (e.g., some of the children were at the hearing test)	"Other"
9.	concerns: behaviors of the teacher (explanation, demonstration, observation, etc.)	"Instructional Behavior"

Table 2 continued

10. concerns: (a) mood of teacher (b) feelings of teacher (c) attitude of teacher (e.g., I was upset with Jane for acting that way)	"Teacher Mood"
11. concerns: (a) time remaining in lesson (b) time a particular part of lesson requires	"Time"
12. concerns: (a) distribution of equipment (b) retrieval of equipment (c) limitations of facility	"Equipment/ Facility"

Within the Subcategories to Identify Focus

If the Statement	Then Record
1. describes: (a) they (b) majority of the students (c) all but a few	"Class"

Table 2 continued

2. describes:	"Group"
(a) the girls/boys	
(b) some of the students	
(c) a few of the students	
(d) a couple of the students	
(e) group 1, 1, 2, etc.	
3. describes:	"Individual"
(a) a student by name	
(b) one girl/boy	
(c) only one	
(d) an individual	
(e) working one on one	
(f) working with each of the students	

Within Subcategories to Identify Desirability

1. describes:	
(a) pleasure with response	"Positive"
(b) approval of response	
2. describes:	"Negative"
(a) displeasure with response	
(b) incorrect response	

Table 2 continued

3. describes: response without value judgement	"Neutral"

Coding Instructional Behaviors	
1. describes: a teacher behavior (e.g., demonstration, explanation, monitoring)	a code for the instructional behavior and a corresponding code in student behavior subcategory if appropriate (e.g., I was watching group one and decided to go back over the correct technique because they were not doing it correctly)

Table 2 continued

Coding Alternative Strategies	
1. describes: actions that teachers implement	"Alternative Action" in the instructional behavior subcategory
2. describes: possible actions that teachers could implement	"(Alternative Action)" place a parenthesis to indicate the action was not taken

Table 3

Planning Productivity and Percent of Activity and Instructional Decisions Made by Teachers Across the Lessons of the Instructional Unit

Decisions	Lessons			Total	Percent
Task/Activity Decisions	1	2	3		
Structure	237	169	154	560	27.0
Procedures	162	137	108	407	19.5
Formations	44	24	21	89	4.2
Time	56	24	24	104	5.0
Adaptations	9	18	17	44	2.1
Subtotal	508	372	324	1204	57.8
Instructional Decisions					
Management	27	9	6	42	2.0
Assess/Feedback	41	43	31	115	5.5
Demonstrate	23	7	3	33	1.5

Table 3 continued

Transitions	8	5	3	16	0.7
Focus Attention	186	99	61	346	16.8
Verbal Instruction	55	44	45	144	7.0
Equipment Use	32	16	17	65	3.1
Objectives	50	38	29	117	5.6
Subtotal	422	261	195	878	42.2
Total	---	---	---	2082	100.0

Table 4

Number and Percent of Interactive Cues Attended by Teachers

	Lessons				
Student Behavior Cues	1	2	3	Total	Percent
Performance	492	493	429	1414	49.80
Involvement	166	207	156	529	18.62
Interest	54	41	54	149	5.24
Effort	7	8	8	23	0.80
Verbalization	7	2	3	12	0.42
Mood Feeling	17	21	21	59	2.07
Interactions	6	9	18	33	1.16
Other	2	2	0	4	0.14
Teacher Context Cues					
Instructional Behavior	145	133	130	408	14.40
Mood Feeling	13	16	16	45	1.58
Time	50	41	44	135	4.75
Equipment/Facility	14	6	9	29	1.02

Table 5

Number and Type of Cues Resulting in Implemented Alternative Actions

Student Behavior Cues	Implemented/Total Attended
Performance	51/64
Involvement	27/37
Interest	3/5
Verbalization/Request	1/1
Total	82/107
Teacher Context Cues	
Instructional Behavior	3/11
Time	8/13
Equipment/Facilities	5/7
Total	16/31

Table 6

Desirability and Focus of Student Behavior Cues Initiating Alternative Actions

Focus	Desirability of Cues (Implemented/Total Attended)		
	Positive	Negative	Neutral
Individual	2/2	12/14	2/2
Group	0/0	23/30	1/1
Class	4/5	35/50	3/3
Total	6/7	70/94	6/6

Table 7

Type, Frequency of Occurrence and Number of Teachers Using Alternative Actions Generated from Student Behavior Cues

Decisions	Frequency of Cue	Number of Teachers Using
(Activity Decisions)		
Prolong Activity	11	5
Shorten/Drop Activity	2	2
Move to Next Activity	4	4
Restructure Activity	9	6
Implement New Activity	4	2
Initiate Student Requested Activity	0	0
Review Previous Activity	1	1
Subtotal	31	
(Management Decisions)		
Restate/Restructure Directions	1	1
Adjust Physical Proximity	5	3
Adjust Level of Praise/ Criticism	0	0

Table 7 continued

Employ Modeling Techniques	1	0
Adjust Focus of Attention	1	0
Ignore/Refuse/Time Out	8	3
Use Student Names	5	4
Solicit Student Input	0	0
Rearrange Student Groupings	3	3
Subtotal	24	
(Instructional Decisions)		
Adjust Level of Praise/ Criticism	1	1
Restructure Instructional Input	6	6
Use Student Demonstrations	0	0
Use Teacher Demonstrations	6	5
Increase Frequency of Questions	1	1
Provide Small Group Attention	3	1
Provide Individual Attention	1	1
Rearrange Student Groupings	9	5
Total	27	

Appendix A

Extended Review of Literature

Research on Teacher Cognition

The beginning of research on teacher cognition can be traced to Phillip Jackson's book Life in the classroom (1968). In this narrative, Jackson describes the mental processes that underlie the complexity of teaching. Shulman (1986) suggests that Jackson brought attention to the importance of describing and understanding the relation between teacher thought and action.

Teacher planning has been defined in two ways (Clark, 1983). The first definition is grounded in a cognitive psychology approach which defines planning as "a process in which a person visualizes the future, inventories means and ends, and constructs a framework to guide future action" (Clark, 1983, p. 7). The second definition attempts to define planning by describing what teachers do when they plan. This definition is based in an ethnographic approach to research on planning which views the teacher as as informant.

The first major goal of early research on planning was to identify the types and purposes of planning. Yinger (1978) in a field study observed an elementary classroom teacher over a five month period. From this study, Yinger identified five kinds of planning: yearly, term, unit, weekly, and daily. In a second study, Clark and Yinger (1979) collected written descriptions of the three most important types of planning used by teachers. This study revealed that teachers engaged in eight different types of planning: weekly, daily, unit, long-range, short-range, yearly and term. In addition,

these teachers indicated that of the eight types of planning reported, unit planning was the most important. The purposes for planning are almost as varied as the types of planning. Research thus far has identified four general reasons for teacher planning. Three of these reasons were identified in a study by Clark and Yinger (1979) and the fourth was provided through an ethnographic study conducted by McCutcheon (1980). The four pervasive reasons why teachers plan are: (a) to meet personal needs (i.e., control the environment, predict future occurrences, lessen anxiety), (b) to meet instructional demands (i.e., to collect, organize and learn material), (c) to incorporate in the lesson (e.g., initiate a particular activity, organize students), and (d) to satisfy the requirements of administrators.

A second major goal of the early research on teacher cognition was the development of planning models. Among the more prominent models were those of Tyler (1950) and Taba (1962). Tyler's model incorporated four sequential steps in the process of planning: (a) specify objectives, (b) select appropriate learning activities, (c) organize activities, and (d) specify evaluation procedures. This model has been generally accepted and used throughout education. Taba's model for planning included six steps: (a) diagnose student needs, (b) develop objectives, (c) select and organize content, (d) select and organize learning activities, (e) evaluate outcomes, and (f) examine the unit for balance and sequence. While these two models differed, the central

purpose of each was to describe how teachers plan.

Zahorik (1975) continued this line of research by not only asking what decisions were made by teachers but also the specific order in which these decisions were made. In a study of 194 teachers from different content areas and across grade levels, Zahorik categorized the written plans of teachers into eight decision areas (objectives, content, activities, materials, diagnosis, evaluation, instruction and organization). The results indicated that the greatest number of teachers were concerned with student activities (81%) and the predominant decision considered first by 51% of the teachers was content. Interestingly, of the 56% of teachers who included objectives in their written list, only 28% initiated planning with their use. From these results, Zahorik concluded that objectives did not seem to be a salient part of planning when measured quantitatively.

In a similar study, Morine-Dershimer and Vallance (1976) analyzed teachers' written plans according to their specificity, format, statement of goal, attention to individual learner characteristics, evaluation procedures, and indication of possible alternatives. Results from this investigation revealed that a majority of teachers were very specific in planning, used an outline format with minimal attention given to goals, evaluation procedures or alternative actions. Additionally, these teachers reported that writing lesson plans was not typical of their planning.

Rather than use written plans, recently researchers have

utilized the "think aloud" technique to investigate teacher planning. This procedure allows teachers to plan aloud with the planning session being audiotaped. Peterson, Marx, and Clark (1978) examined planning in a laboratory setting with 12 teachers instructing a lesson on social studies to a small group of students whom they had not taught previously. Using the think aloud procedure, teachers' verbal statements were coded and classified into categories including objectives, materials, subject matter and instructional process. The primary finding from this study was that teachers spent the majority of their time on the content to be taught followed by instructional process and the smallest amount of time on objectives. These findings supported the work of Zahorik (1975) and Morine-Dershimer and Vallance (1976).

However, four limitations of Peterson, Marx, and Clark's study were leveled. First, teachers in the study were asked to teach a unit which they did not normally teach. Second, planning sessions were held immediately prior to the teaching episode and were limited to 90 minutes. Third, teachers instructed students whom they had not known thus planning for individual differences was not possible. Finally, because the objectives and goals of the study were defined apriori, there was little need for reiteration by teachers.

By conducting a field study, Yinger (1978) was able to eliminate the limitations cited in the Peterson, Marx and Clark study (1978). Yinger used a combination of ethnographic

and process tracing techniques to collect data. Results supported Zahorik's finding (1975) that teachers predominantly focus on instructional activities during planning. Therefore, Yinger concluded that the basic instructional unit in the classroom was the activity rather than the objective. Additionally, Yinger found that routines controlled much of what occurred in a classroom. Yinger defined a routine as "an established procedure whose main function is to control and coordinate specific sequences of behavior (Yinger, 1979, p. 165). Furthermore, Yinger identified four types of routines: (a) activity routines, (b) instructional routines (e.g., strategies or styles of teaching), (c) management routines (e.g., distribution and retrieval of materials, transitions between activities), and (d) executive planning routines (e.g., systems of established patterns used by teacher in planning).

From this study, Yinger developed a three stage theoretical model of planning. Stage one was characterized as a discovery cycle in which the problem was defined, the goals to be obtained were specified, and the available materials were considered. Stage two was identified as the problem formulation phase. During this stage, teachers elaborated on the considered plan and developed alternatives. Stage three of the planning model consisted of evaluation and routinization of the plan. During this stage teachers' mental image or script for the plan developed. Thus, Yinger advanced a cyclical approach to planning rather than

the traditional linear model proposed by earlier researchers (Tyler, 1950; Taba, 1962).

McLeod (1981) took a different tack in investigating the role of objectives in the planning process. Instead of asking whether planning initiated with objectives, McLeod examined when in the planning and teaching process teachers thought about objectives. Thus, unlike previous studies which investigated only planning, this study included planning and three additional phases (preactive planning phase 2, interactive phase, and postactive phase). Preactive planning phase 2 was defined as the time after planning but prior to teaching. The interactive phase was described as the time when teaching occurred and postactive--the reflective time after a teaching episode. Using videotaped replays of the lesson taught, McLeod conducted stimulated recall interviews to determine when teachers formulated objectives. Results indicated that the largest percentage of intended learning outcomes was identified during the interactive stage followed by preactive stage 2 and postactive stage. In addition, McLeod determined the types of learning outcomes that teachers formulated (cognitive, social, psychomotor). The findings indicated that 58% were cognitive, 35% affective and 7% were psychomotor.

A major contribution of McLeod's work was providing an overall picture of teacher cognition during the various phases (preactive, interactive, postactive). This design drew attention to the fact that studies investigating only

one particular phase of teaching may result in inaccurate conclusions.

Interactive Thoughts

The majority of studies investigating the interactive thoughts of teachers have utilized the stimulated recall technique. Although the methodology for conducting the interviews (number of segments viewed, questioning format used) has varied considerably, the coding and analysis of the stimulated recall interviews has been similar. Typically, teachers' responses during the interview have been audiotaped and coded into categories with frequency of occurrence compared across the categories to determine the focus of teachers thoughts.

In a review of six studies using the stimulated recall procedure, Clark and Peterson (1986) have indicated that teachers report the largest percentage of thoughts focus on the learner (40% to 60%) followed by instructional process (19% to 30%). Moreover, a relatively small proportion of teacher statements focus on content/subject matter (5% to 14%) and even less attention was given to objectives (3% to 14%).

Interactive Decisions

While some researchers have described the focus of teachers' thoughts during the interactive phase, other researchers have attempted to identify interactive decisions (i.e., alternative strategies or alternative actions) taken by teachers during the teaching process. Several definitions

have been advanced to describe an alternative decision. Sutcliffe and Whitfield (1979) defined an interactive decision as a conscious act that occurs when two choices are present. That is the choice to change or the choice to continue with the original plan. Similarly, Marland (1977) defined an interactive decision as a conscious choice which includes three components: (a) explicit reference to consideration of alternatives, (b) evidence that a decision was made, and (c) evidence that the teacher implemented the alternative during the lesson. Marland's definition of an interactive decision has been used in a number of studies (Fogarty, Wang, and Creek, 1982; Morine & Vallance, 1975; Wodlinger, 1980).

Another related issue in studying interactive decisions is the frequency with which alternatives are used. By standardizing the time frame, Clark and Peterson (1986) were able to compare data from five studies (Fogarty, Wang, & Creek, 1982; Morine-Dershimer & Vallance, 1975; Marland, 1977; Shroyer, 1981; Wodlinger, 1980). Findings showed that on the average, teachers made an interactive decision once every two minutes.

Interactive Decision Making Models

Thus far, two models have been advanced to describe the process of interactive alternative decisions. The first model developed by Peterson and Clark (1978) was grounded in the notion that teachers' decision making involved two or more choices when the teacher assessed that the lesson was going poorly. The basic notion is that teachers follow different

paths of action depending on the student cues occurring in the classroom. In Path 1, the teacher observes the students' behaviors and judges that everything is within a tolerable level. Thus, no alternative action is necessary. In path 2, the teacher observes and judges that students' behaviors are not within in an acceptable level (e.g., the teacher may judge that the material chosen for students is not of an appropriate difficulty level). However, in path 2, the teacher does not have an alternative action available for implementation. In path 3, the teacher again determines that the student cues are not within an acceptable range but this time there is an alternative available. But in this instance, the teacher chooses not to implement the alternative but rather continue with the original plan (e.g., teacher observes student in off task behavior, has alternative course of action--call name--but instead delays action and continues to monitor the situation). In path four, the teacher judges that student behaviors are not within an acceptable level, and implements an alternative plan of action. Using this model, Peterson and Clark investigated the paths of actions used by 12 experienced teachers while instructing a social studies unit to three groups of junior high students. Results indicated that the majority of teachers (61% to 71%) reported using path 1 across the three days of instruction. Further insight is gained from the transcript of one of the teachers participating in the study. When questioned whether any alternative actions were being considered, the teacher

responded ," At this point? No. None at all. It was going along. The only time I think of alternative strategies is when something startling happens " (Peterson & Clark, 1978, p. 561). This finding lends support to previous research which indicates that most classroom interaction can be described as "business as usual" (Goodlad & Klein, 1970); Hoetker & Ahlbrand, 1969).

Conflicting results have been reported concerning the number of alternatives considered at one time by teachers. Morine and Vallance (1975) reported that on the average, teachers reported considering three alternative courses of action when implementing alternatives. In contrast, Marland (1977) found that teachers considered only two alternatives while Wodlinger (1980) in a case study of one teacher reported that only one alternative course of action was considered for the majority of the interactive decisions.

The second model was developed by Shalverson and Stern (1981). This model is based on the premise that teachers form mental images while planning and during the interactive phase activate these images into routines. Furthermore, Shalverson and Stern advance the idea that teachers' alternative decisions only occur when the teaching routine is interrupted. The operation of this model is similar to a computer. That is, once the routine is initiated, it typically runs uninterrupted. However if interrupted, revaluation is necessary. As in the Peterson and Clark model, the decision making process involves the observation of student cues and

determination of whether these cues are within an appropriate range. If cues are not within an acceptable range, the teacher decides whether immediate or delayed action is necessary. If immediate action is necessary, the teacher then retrieves and implements the alternative action. If an alternative action is not available then the teacher reacts spontaneously and continues with teaching. However, if immediate action is not necessary, the teacher may choose to delay initiating the alternative or may simply store the information for future use. Clark and Peterson (1986) point out that an advantage of the Shalverson and Stern model is that it incorporates the idea of a "routine" in explaining teachers' interactive decision making. Consequently, only one alternative decision is considered.

Antecedents of Interactive Decisions

Both of these planning models have assumed that the only antecedent for teachers' interactive decisions are student behavior cues. However, Marland (1977) reported that the majority (56%) of teachers' interactive decisions occurred in response to factors other than student behavior cues (e.g., environmental constraints, time constraints, teacher behavior). Similar findings by Wodlinger (1980) and Fogarty et al., (1982) have strengthened Marland's contention. Therefore, adjustments must be made in the models previously presented. Clark and Peterson (1986) suggest that both models need to be revised to reflect two factors. First, a model of teacher decision making should reflect the alternative action

as a deliberate choice rather than one choice among several possible solutions. Second, both models should incorporate factors other than student behavior cues as antecedents for alternative actions. A third possible factor that should be addressed in such a model has been identified by Parker and Gehrke (1986). This factor addresses the underlying assumption that alternative actions are made only in response to situations deemed out of control. This assumption precludes the notion that teachers can implement alternatives in an effort to improve an already acceptable situation.

Types of Alternative Actions Implemented

Research has shown that when changes in the lesson do occur, they are generally minor adjustments in the routine rather than major adjustments. Joyce (1978) refers to these adjustments as "fine tuning" while Morine-Dershimer and Vallance (1976) use the term "inflight adjustments". Moreover, the research has shown that teachers are reluctant to initiate change even when the lesson is going poorly (Peterson & Clark, 1978). Shalverson and Stern (1981) suggested two reasons why teachers are reluctant to initiate major adjustments or new routines. First, the original routine selected may be the best available to the teacher. Second, the routine selected may be the only routine available. A third possible reason was advanced by Doyle (1979). Doyle suggests that changing routines during a lesson creates a time of uncertainty. This increases teachers' information processing duties while decreasing their ability

to monitor study behavior and involvement. Similarly, students during this time would be required to adjust to the new routine which in turn may create management problems.

Teacher Effectiveness of Interactive Decision Making

Because one of the goals of research on teaching is to improve the effectiveness of teachers, researchers have attempted to identify the kinds of instructional decisions effective teachers make. However at the present time, little research has been directed toward this goal. Doyle (1979) described the effective teacher as an information processor. That is, the teacher collects information on students from the beginning of the year and uses this information to structure the classroom environment. Once the information is initially gained, the effective teacher structures the class using the four routines (activity, instructional, management, executive) suggested by Yinger (1978). This routinization frees the teacher for tasks such as monitoring, assisting individuals and small groups of students and solving unexpected events not incorporated into a routine.

More recently, researchers have used an expert/novice paradigm to describe the interactive thoughts and decision making processes of effective teachers (Housner & Griffey, 1985; Sherman, Sipp, & Taheri, in press). A coding instrument developed by Housner and Griffey (1985) can be used to record the perception (performance, involvement, interest, effort, etc.), focus (class, group, individual) and desirability (positive, negative, neutral) of teachers' thought processes

while teaching. By using this same instrument, the antecedents of teachers' interactive decisions may also be traced. Findings from Housner and Griffey's study indicated that experienced teachers made most of their interactive decisions in response to performance cues followed by involvement; whereas, inexperienced teachers implemented changes generated by student interest cues and student requests. The finding regarding the desirability of cues showed that both experienced and inexperienced teachers primarily implement alternative actions from negative cues (i.e., when the lesson is going poorly). This result parallels classroom research. However, in contrast to classroom findings, it was noted that a substantial number of alternative actions were implemented in response to positive cues. As for the focus of cues, individual cues were used more often to implement changes by experienced teachers while inexperienced teachers initiated most changes in response to class cues.

While these findings provide a spring board for future studies, caution must be taken in their interpretation. The study was conducted in a laboratory setting with a class size of four and as the authors point out these findings may or may not generalize to the natural setting of the classroom/gymnasium.

In conclusion, research on teacher cognition while in the beginning stages shows promise in several ways. First, by studying teacher thought processes, an understanding may be

gained about the relation between teachers' thoughts and actions. Thus what once was termed the "hidden curriculum" may be more readily accessible. Consequently, researchers can explore the thoughts and decisions that motivate and guide teachers in choosing activities, materials, and instructional strategies. Second, this framework offers the opportunity of linking research on curriculum and research on teacher behavior. By probing teachers' thought processes, researchers may gain knowledge in how theory translates into practice. Thus, providing an opportunity to bridge the noted gap between theory and practice.

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Appendix B

Pilot Study

Pilot Study: Phase One

Subjects

The subjects were 124 fifth grade students from four intact physical education classes in two elementary schools (two classes per school) within the East Baton Rouge Parish Schools. From the subject pool, seven girls and boys were randomly selected for skill testing (N = 56, 28 girls and 28 boys) from each class. Seventy two percent of the males (20/28) and 86% of the females (28/32) had not had previous experience in an organized basketball program.

Skill Test

The Control Dribble Test was chosen from the AAHPERD Basketball Skill Test (Hopkins, Shick, & Plack, 1984) to evaluate dribbling skill. The test has been shown to be a valid and reliable measure of basketball skill for age 10 years through college level using a standard size ball. The fifth grade students in the present study participate in a physical education program which uses women size basketballs. Therefore, reliability estimates were established for both fifth grade girls and boys using the smaller size ball.

Procedures

The control dribble test was administered on an outdoor basketball court (concrete surface) using a women size basketball. With the exception of the size of the basketball, the procedures outlined in the AAHPERD Basketball Skill Test Manual (Hopkins et al., 1984) were followed. The test

requires students to dribble the basketball through an obstacle course using a specified pattern. The control dribble test was administered on two successive days. The investigator and two trained assistants administered the test.

Results

The scores for the control dribble skill test were analyzed using a subjects by trials ANOVA (28 X 4) for the girls and boys. Intraclass correlation coefficients for girls and boys were .93 and .97 respectively.

Pilot Study: Phase Two

The method for the pilot study is identical to the methods sections provided in the proposal with the following exceptions:

1. The subjects were three physical education teachers (2 females and 1 male) randomly chosen from a sample of 15 physical educators identified as experts by the director of physical education.
2. Students participating in the study were 80 fifth graders (42 girls and 38 boys) from 3 intact physical education classes (one class randomly selected from each teacher's fifth grade sections).
3. Preactive planning and stimulated recall interviews were conducted for each lesson of the instructional unit.
4. Interactive data was analyzed for the focus of decision making.

Results and Discussion

The results of the mean pre- and post-control dribble test for each class are presented in Table B1.

Insert Table B1 about here

To measure the improvement in dribbling a pre-posttest design was used. Two dependent t tests were conducted. The girls showed significant improvement ($p < .05$) on the control dribble test, t (2) = 4.58 (30.97 vs. 25.97). However, the boys' improvement was not significant t (2) = 4.03 (23.36 vs. 21.47).

Preactive Planning

The planning statements of three expert physical education teachers were coded using an adaptation of an instrument designed by Housner and Griffey (1985). The results of the focus of planning for each of the three teachers across the categories of the instrument are presented in Figures B1, B2, and B3.

Insert Figures B1, B2, and B3 about here

As the figures illustrate, the main focus of preactive planning was in the category of task/activity decisions. These results are consistent with previous findings of Clark and Yinger (1979) and Peterson, Marx, and Clark (1978).

It should be noted that teachers in this study did not follow the traditional model of curriculum planning advanced by Tyler (1950) (specify objectives-> select activities-> implement activities-> assess performance) but initiated planning with activities or drills rather than objectives. This result parallels earlier findings (Borko, Cone, Russo & Shalverson, 1979; Marx & Peterson, 1981; Popham & Baker, 1970).

The overall planning productivity for teachers in the study is graphically presented in Figure B4.

Insert Figure B4 about here

The findings show that for two of the three teachers, planning productivity was highest on the first lesson of the unit and decreased across the remaining lessons of the unit with the exception of a slight increase from lesson three to four. These two teachers' planning patterns are consistent with previously reported results (Clark & Peterson, 1986; Peterson, Marx & Clark, 1978). The third teacher's productivity pattern did not follow the anticipated pattern. The sharp increase in planning statements for lesson four is directly related to the teacher's use of task cards in presenting the lesson. A visual inspection of the raw data for the planning categories shows an increase in all three categories but an especially dramatic increase in the number of planning statements in the

subcategories of structure, procedures, time, equipment, observation/assessment/feedback and learner sub group.

Interactive Decision Making

The teachers' interactive decision making was analyzed by coding statements from the stimulated recall interview. The same coding instrument used to analyze preactive planning was also used to code the interactive decisions. Results of the teachers' focus during teaching are presented in Figures B5, B6, and B7.

Insert Figures B5, B6, and B7 about here

For two of the teachers, attention to the learner was the primary focus during teaching. The remaining categories of instructional process and task/activity seemed to be related to the particular lesson's design. The third teacher focused on the learner during lesson one and two; however, during lessons three through five, instructional process and task/activity were more salient features of attention. This finding can most likely be attributed to the introduction of task cards during the unit.

The overall interactive productivity levels of the three teachers are presented in Figure B8.

Insert Figure B8 about here

Each of the teacher's interactive productivity levels followed a different pattern across the lessons of the instructional unit. Because the responses of the teachers were dependent upon the interview questions selected; interpretation of the interactive productivity level must be made cautiously. For example, one question asked during the stimulated recall interview focused on the use of teacher objectives for the segment. Consequently, the teachers' responses regarding the sub-category of objectives in the coding instrument were probably spuriously high.

One interesting result was noted while transcribing the stimulated recall interviews. On the average, students were not engaged in activity until 4 minutes into the lesson. Thus the initial four minutes of the class instruction were spent in explanations, reviews, and organization. This finding differs from results reported by Housner and Griffey (1985). The longer time for entry into activities in the present study can probably be attributed to class size. In this study, teachers worked with an entire class compared to four students in the Housner and Griffey study.

From these results, the following recommendations were made.

1. The initial viewing segment will be 4 minutes followed by eight 2 minute segments.
2. Although the repeat of a particular activity is permissible, repeating a particular plan will not

be allowed.

3. The preactive category of learner will be deleted because attention during this phase seems most related to activity/task and instructional process.
4. The preactive coding instrument will be a modification of the instrument designed by Housner and Griffey (1985). The modification will include a subcategory for objectives in the instructional process category.
5. Interactive data will be analyzed using the coding instrument designed by Housner and Griffey (1985). This instrument will allow a more extensive examination of data on three levels (perception, focus, and desirability).
6. Alternative actions of teachers will be recorded and identified according to three categories (activity, instructional process and management).
7. The data for preactive and interactive phases of the study will be analyzed for the first three lessons of unit rather than five lessons. However, teachers will engage in planning sessions for each of the five lessons.
8. If task cards or other individualized instructional techniques are used, the entire unit should adhere to the same format.

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Table B1

Means and Standard Deviations for Pre- and Post- Control Dribble Test for Pilot Girls and Boys

Class	Gender	Pre-Test Mean	Standard Deviation	Post-Test Mean	Standard Deviation
1	Girls	31.41	8.31	27.50	6.60
2	Girls	32.08	8.12	24.90	5.87
3	Girls	29.43	4.30	25.44	2.73
1	Boys	23.85	3.46	21.40	2.48
2	Boys	22.97	2.70	20.73	2.24
3	Boys	23.28	2.88	22.32	2.49

Figure Captions

Figure 1. Percentage of decisions during planning for teacher 1.

Figure 2. Percentage of decisions during planning for teacher 2.

Figure 3. Percentage of decisions during planning for teacher 3.

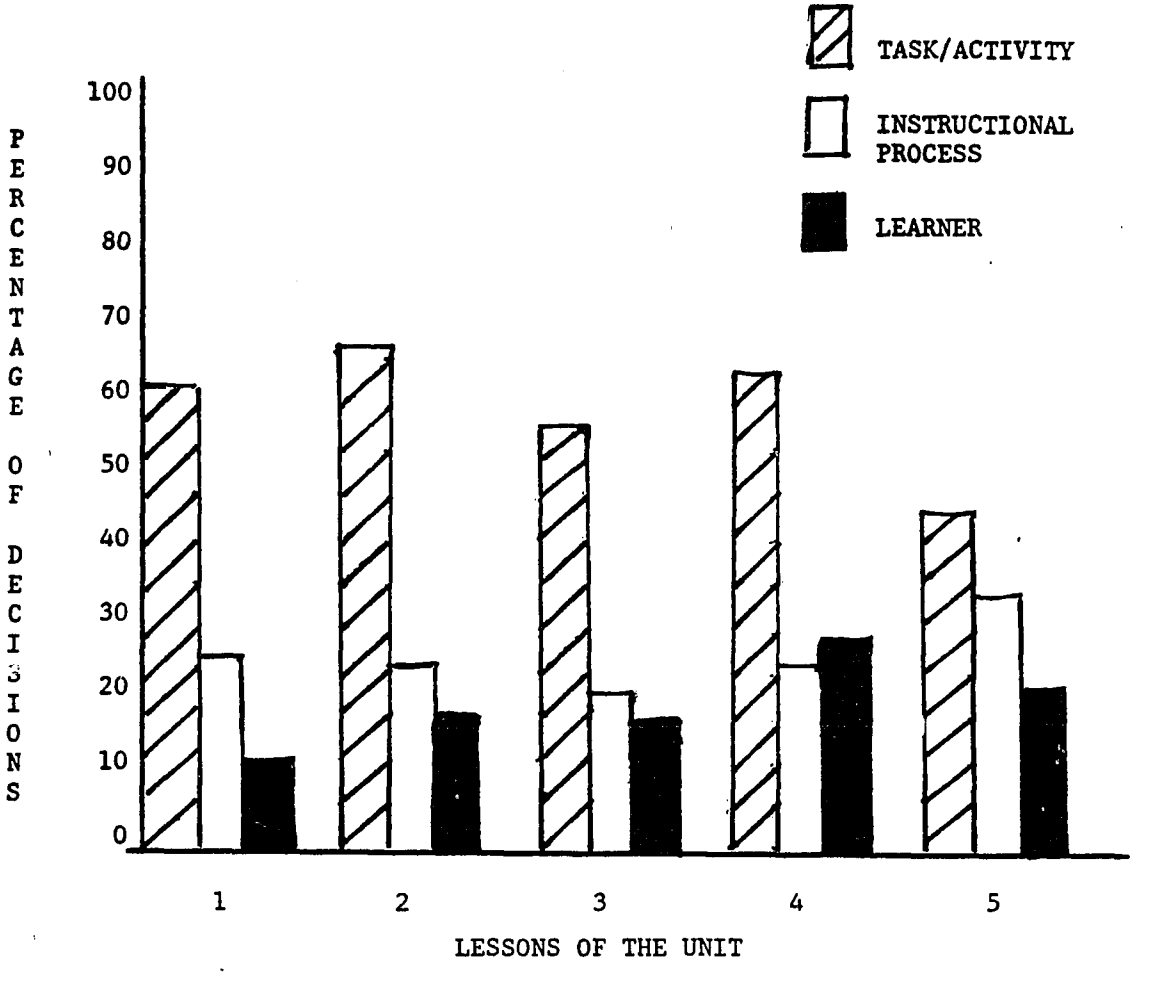
Figure 4. Planning productivity level across the lessons of the unit for teachers 1, 2, and 3.

Figure 5. Percentage of decisions during interactive teaching for teacher 1.

Figure 6. Percentage of decisions during interactive teaching for teacher 2.

Figure 7. Percentage of decisions during interactive teaching for teacher 3.

Figure 8. Interactive productivity level across the lessons of the unit for teachers 1, 2, and 3.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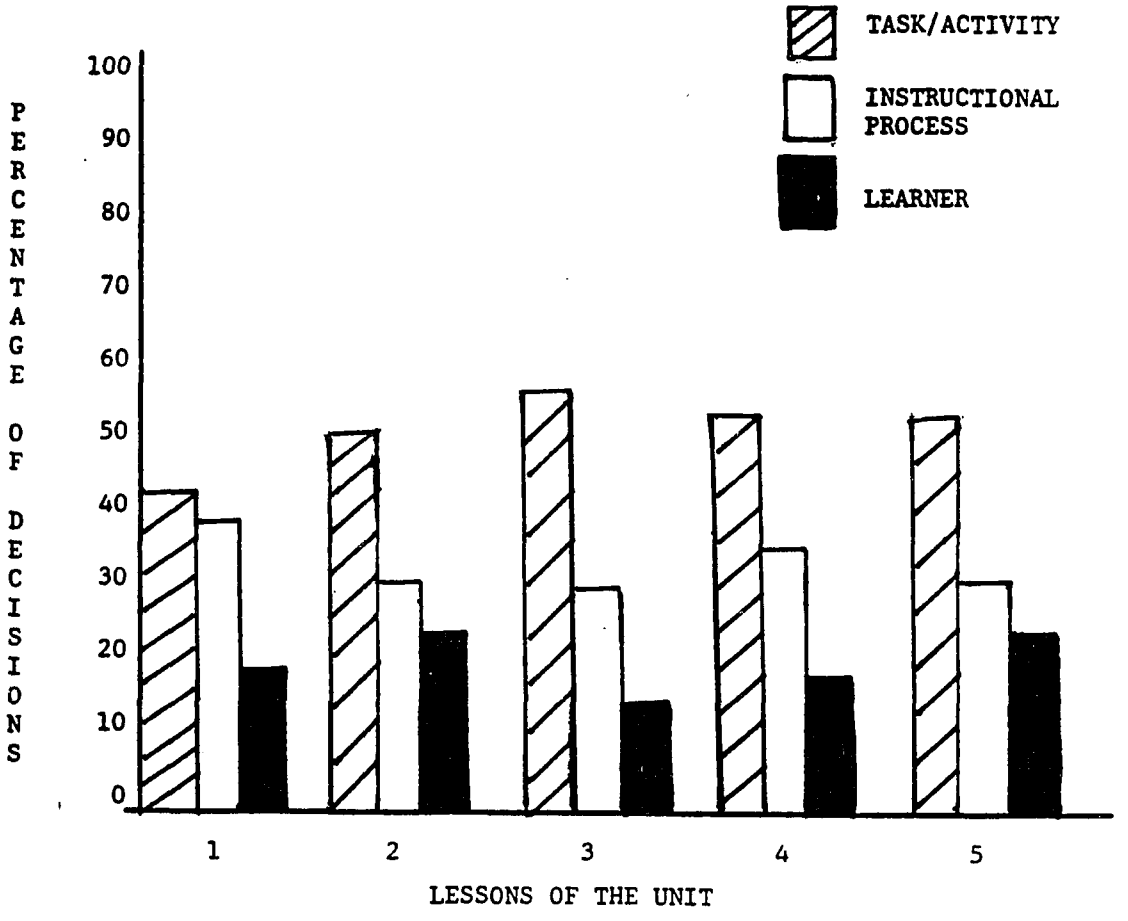
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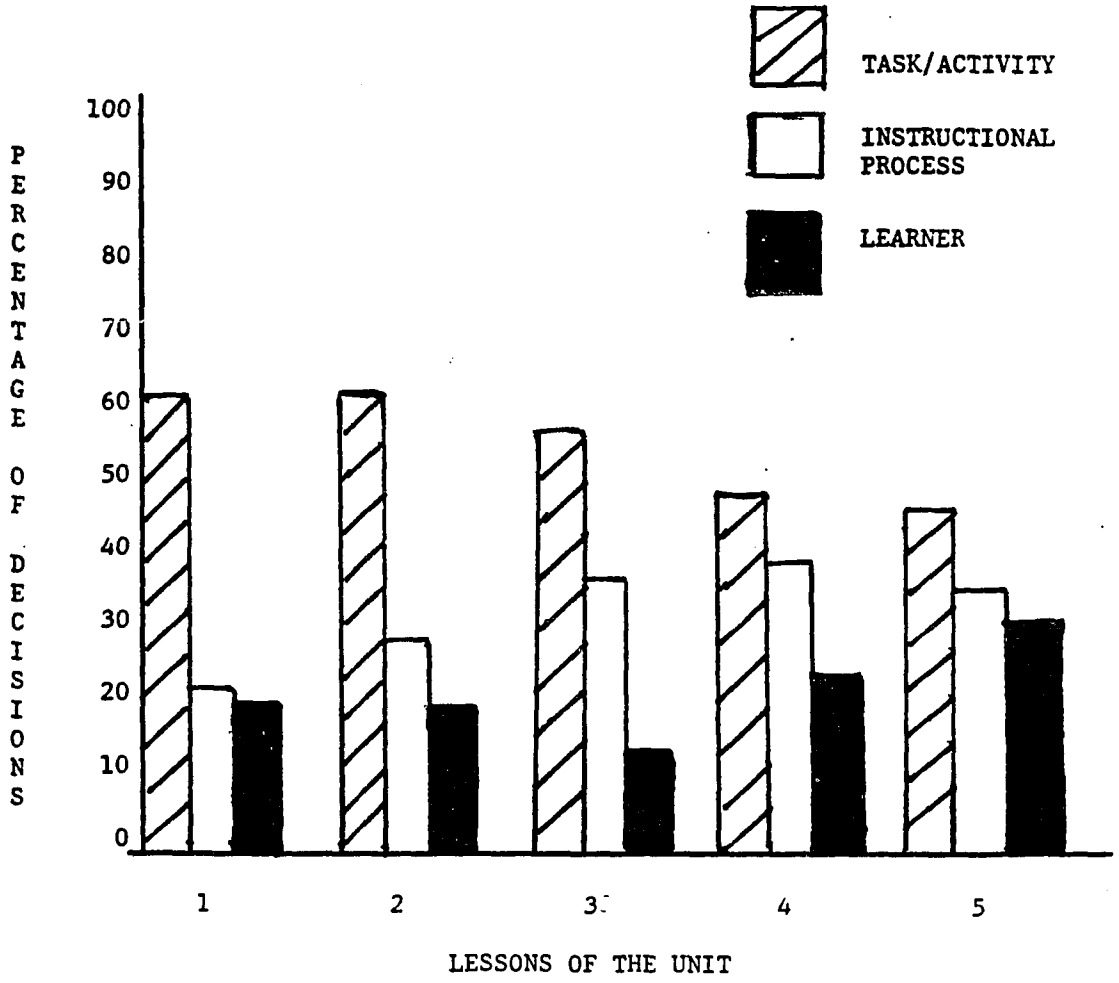
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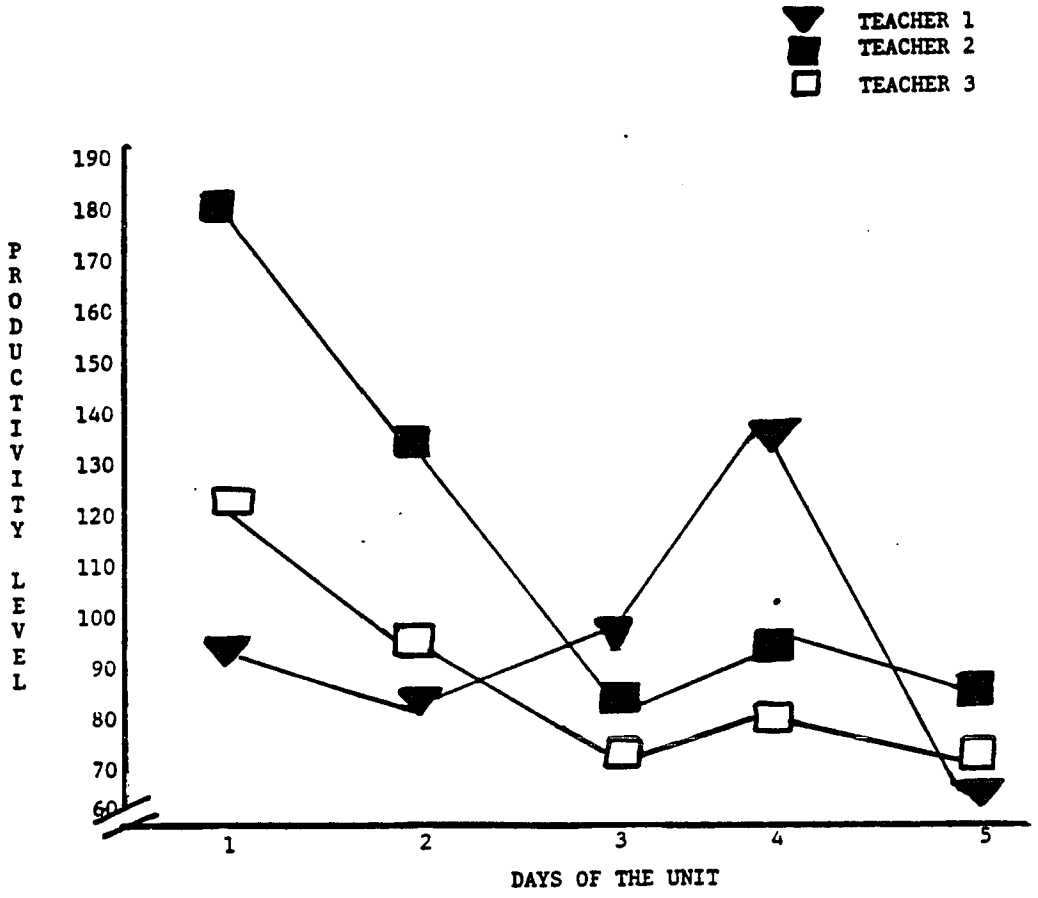
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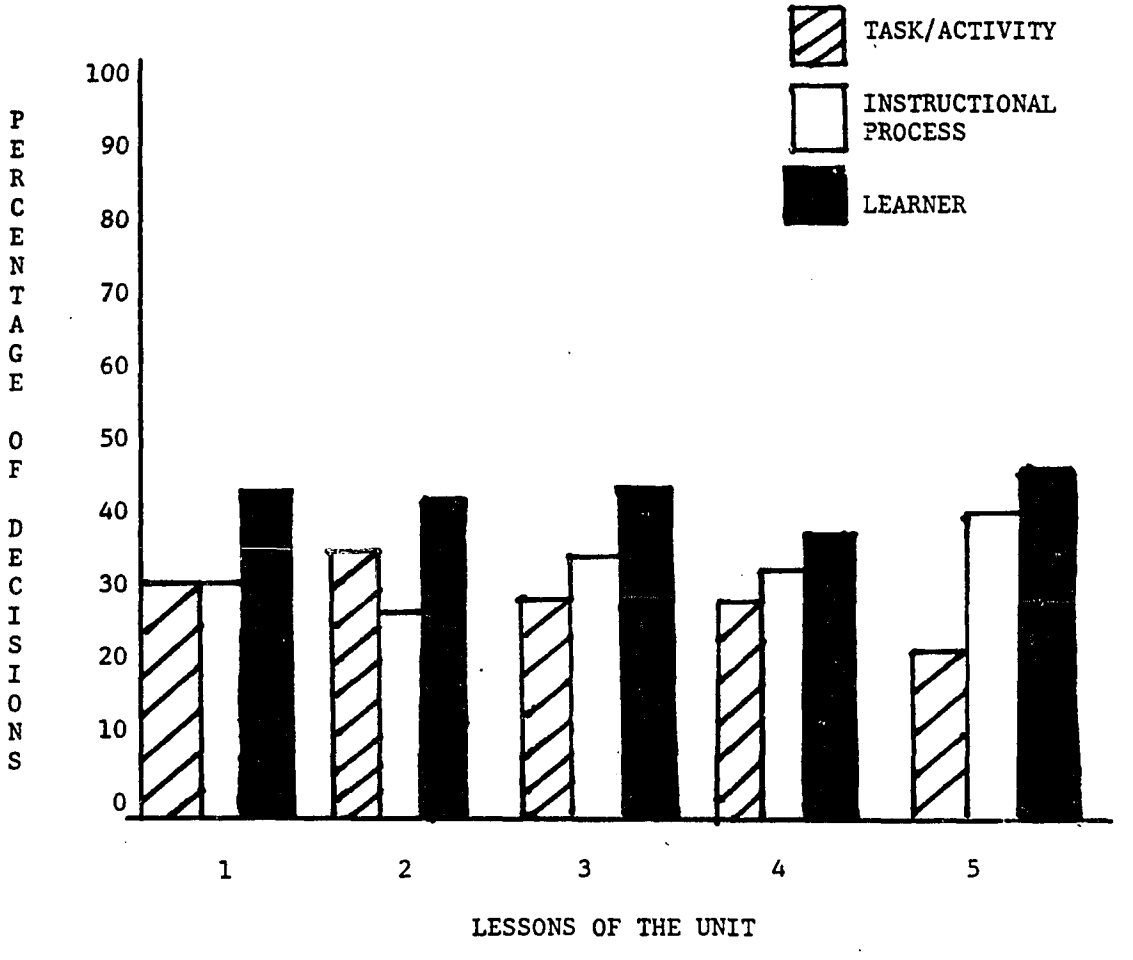
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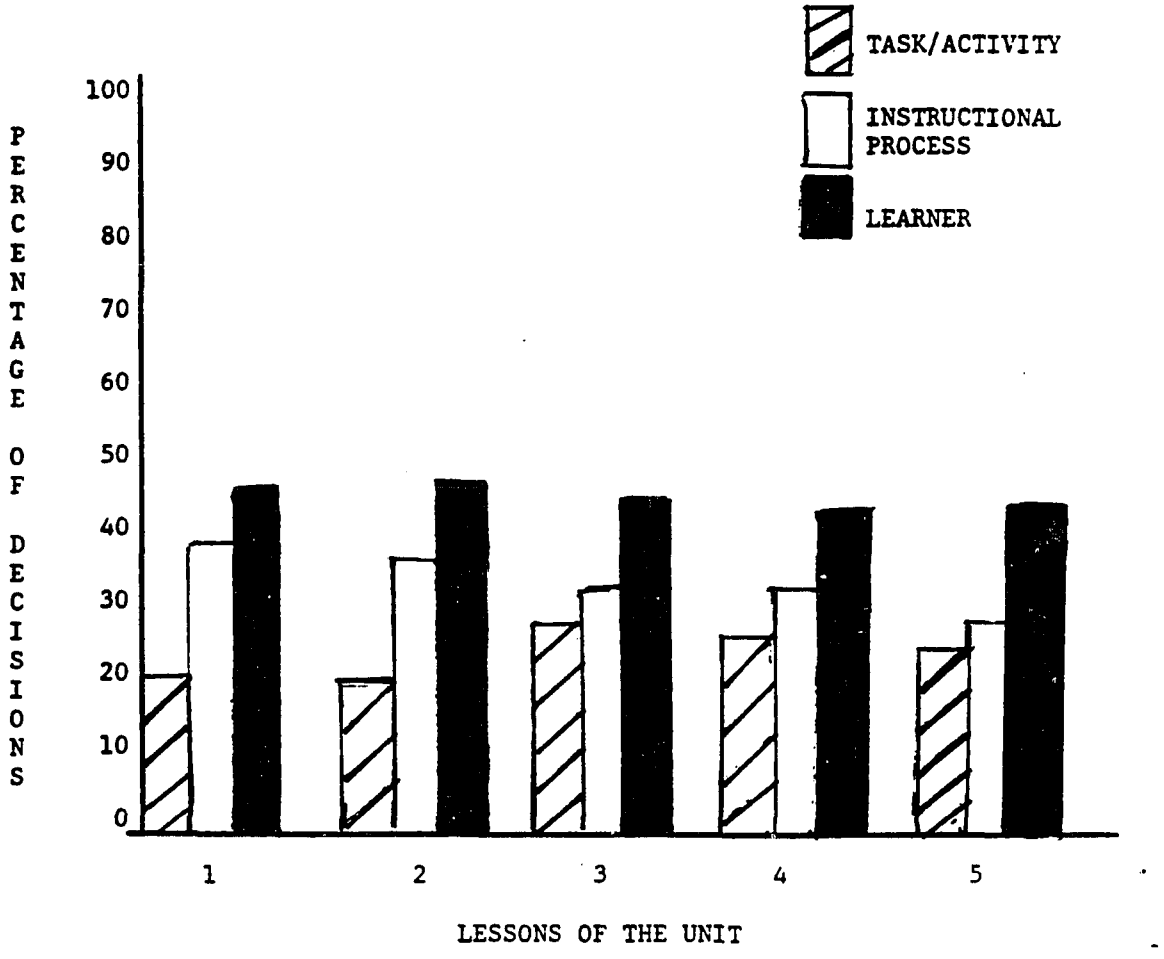
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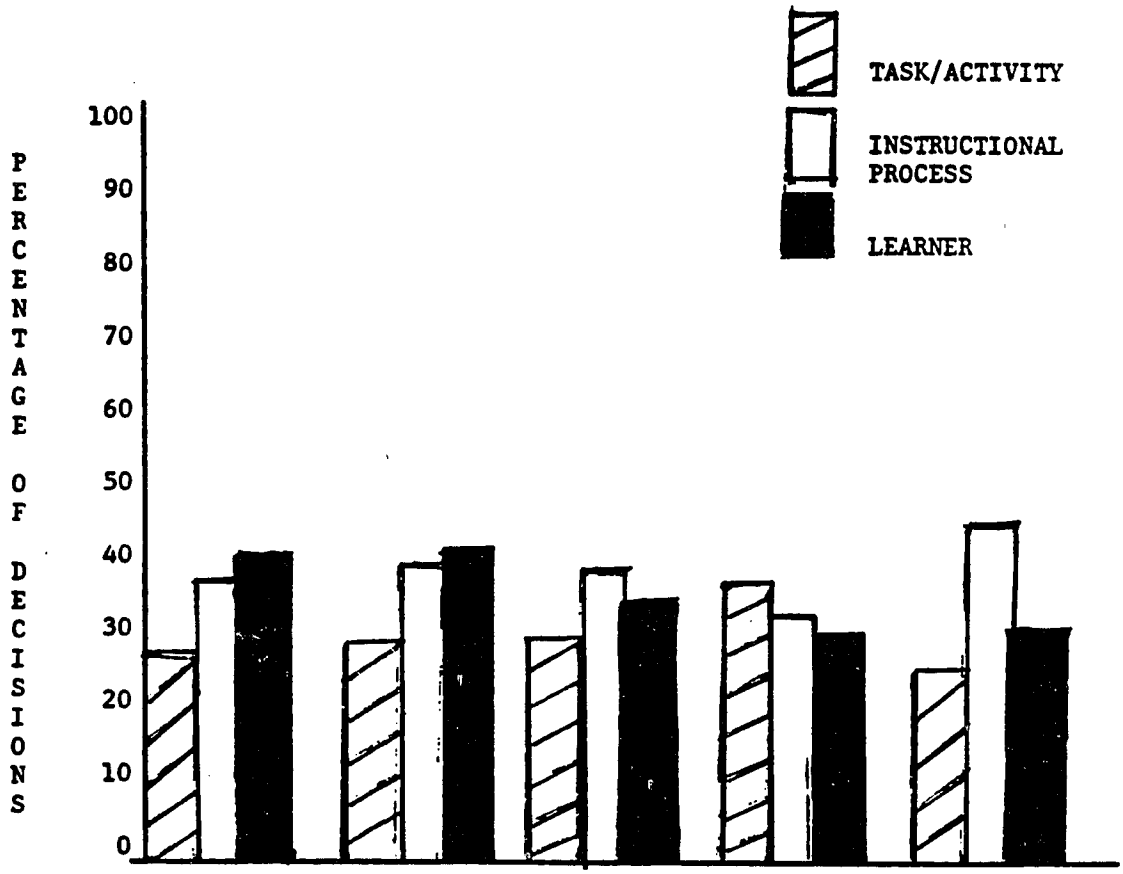
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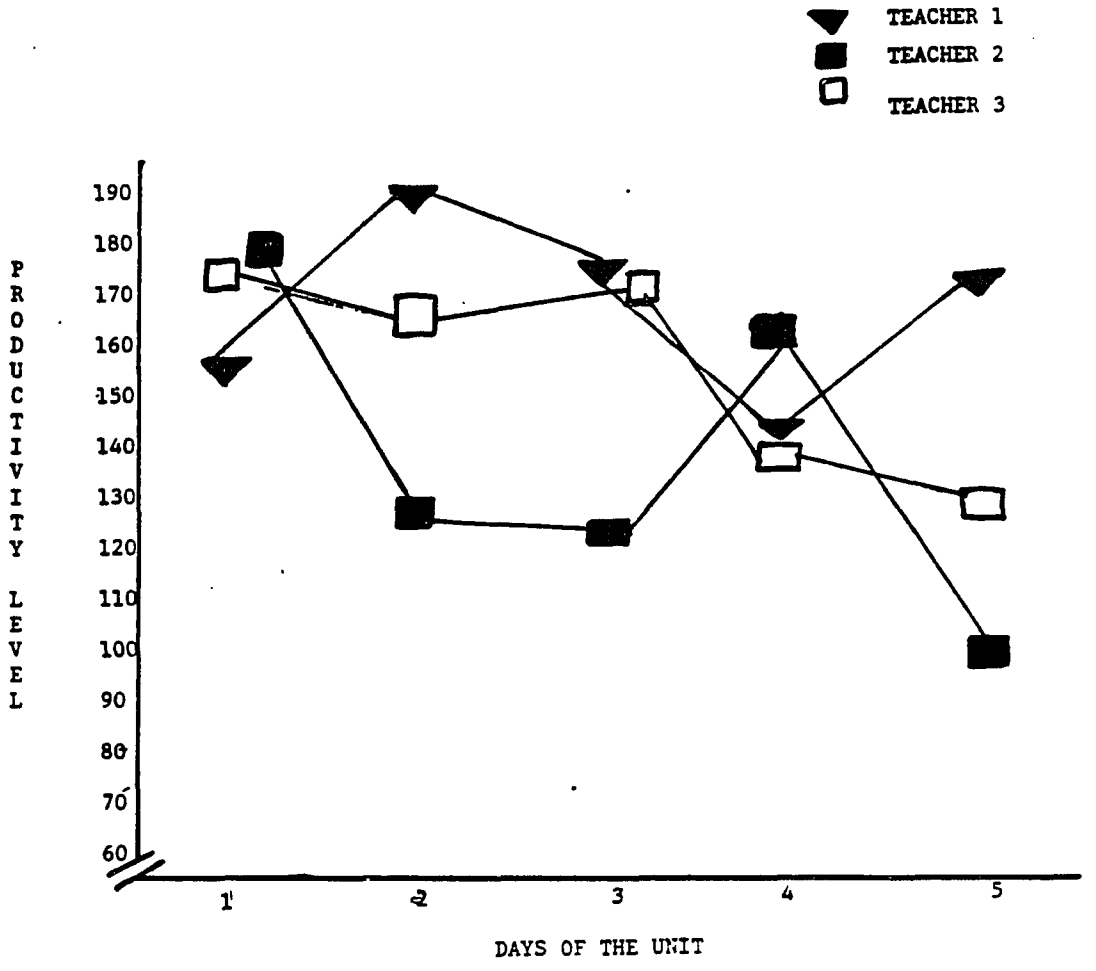
TEACHER 1
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TEACHER 3
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Appendix C

Guidelines and Instructional Materials for the Study

Dear Parents:
Your son/daughter's class has been asked to participate in a research project conducted by professors and employees of Louisiana State University. The purpose of this study is to investigate the planning and decision making of elementary physical education teachers. The physical education teacher will be videotaped as he/she conducts the regularly scheduled activity of basketball dribbling. The primary subject for this study is the teacher. Students will simply participate in their regularly scheduled physical education class.

Students will be assessed before and after the unit on a dribbling skill test. The skill test will be conducted to see if any relation exists between planning, decision making and student performance. Your child will in no way be compared or identified by name nor will this activity affect the physical education grade.

In order for your child to participate in this study, please sign this letter and return it to your child's classroom or physical education teacher by September 15, 1986.

I would like to thank you in advance for your cooperation.

Deborah J. Howell
School of Health, Physical Education, Recreation, and Dance
Louisiana State University
Baton Rouge, Louisiana

Parent or Guardians Signature: _____

Child's Name: _____

Teaching Guidelines

Overview

I am in the process of studying the planning and decision making of elementary physical educators. Essentially, I am attempting to identify the thoughts that expert teachers have in planning daily lessons. I am also attempting to identify the types of cues that influence expert teachers to make decisions during the actual teaching process.

Skill Test

Students will be tested on the AAHPERD Control Dribble Skill Test prior to and again at the conclusion of the instructional unit. The procedures for administering and recording the results will be provided. Please review the procedures several times. I have allowed two days for pre- and post-skill testing.

Planning

I will provide you with a sample planning tape and we will listen to it during our meeting prior to the start of the instructional unit. The maximum time allowed for planning will be 45 minutes. It is crucial to the success of the study that you verbalize your thoughts. As expert teachers, you have tried many different approaches and activities, but I do not have access to your thoughts unless you verbalize them. Do not worry if you change your mind as you plan the lesson, or if you plan something and then during the actual class you vary from your plan. These procedures should be followed in planning each day's lesson.

1. Allow yourself a 45 minute time frame in which to work undisturbed. You may not use all of the time but it is there if you need it.
2. A cassette recorder and tape will be provided for your use. Please start each tape by stating your name, school, month, and date. Then stop the recorder and check to be sure that it is working correctly. Then proceed with your planning. Remember that the objective of the instructional unit is to improve the dribbling skill of the students.
3. A packet of content materials (skill analysis of dribbling, skills, drills, and modified leadup games) will be provided for your use during the instructional unit. These materials are provided for your convenience but you are not required nor restricted to their use.
4. Once you start planning, do not stop the tape until you are finished. As you record your plan don't worry about how it sounds. Please do not replay the tape. Remember that as you are planning, you will be talking through different aspects of the lesson, there may be pauses on the tape when you are not talking.

Teaching Unit

Briefly, I am asking you to teach five 20 minute lessons to one section of your regularly scheduled fifth grade classes. The topic of the five day unit is basketball dribbling. The objective of the unit is to improve students' dribbling skill. I will be present at each class session during the instructional period and will video-tape you and your class. The following procedural format should be followed during the instructional unit.

1. The instructional period is 20 minutes. You will have five minutes to conduct warmup exercises, call roll, etc. Please take roll each day, this information is needed for analysis purposes.
2. The equipment for the instructional unit will be provided. You will have 15 women size basketballs, 10 blinders, 15 cones, 15 pennies, 15 flags, and two stop watches. In an effort to standardize equipment, I ask that you use only the equipment provided.
3. The instructional space will be limited to the outdoor basketball court area. In case of inclement weather, the unit will continue in your indoor facility.
4. I will signal you to begin the instructional unit on dribbling. At that point you will begin teaching the day's lesson. Dispensing of equipment and organization of students is included in the 20 minute lesson. The equipment will be situated in the same position each day. I will notify you when two minutes remain in the lesson.

Interview

An interview will be conducted following each day's instructional lesson. The purpose of the interview is to identify the cues or factors that you use in making decisions during the teaching process. The interview will follow this format. Following each lesson, you and I will view the video-tape together. At pre-determined intervals, I will stop the video tape and ask you a series of questions regarding the segment of tape previously viewed. I will also ask you if you have any observations that you would like to make regarding the tape. It is crucial to the success of the research project, that you try to recall your thoughts during the lesson and verbalize those thoughts to me. Remember there is no one right answer or best way of doing things, the interview is not an evaluation but rather a probe into finding out what factors affected you to make decisions during the teaching process. Additionally, I want you to know that it is alright to report that you had off-task thoughts (i.e., it's hot out here, I sure am tired today, etc.).

Activity Packet

Enclosed are some skills, drills, and activities that you may use during the instructional unit.

Dribbling

Dribbling is a skill used to advance the ball, break of a basket or maneuver a player out of a difficult position.

The dribbler's knees and trunk should be slightly flexed. The head and eyes should be forward. The dribbler should not look directly at the ball but rather look beyond the ball and see it in the lower part of the visual area. To dribble, the hand should be cupped and relaxed, the ball should be pushed with the fingertips. There should be very little overall arm motion and the palm of the hand should not slap the ball.

Dribbling should be practiced with both the dominant and non-dominant hands. To be a successful dribbler, children must be comfortable using both hands. For young children, dribbling with the non-dominant hand may be difficult and will take practice to develop.

Dribbling Skills

1. Dribbling the ball while in a kneeling position
2. Dribbling the ball while in a standing position
3. Dribbling the ball with the dominant hand
4. Dribbling the ball with the non-dominant hand
5. Dribbling the ball in a rhythm, four dribbles with one hand and then switch and four dribbles with the other hand
6. Dribbling while looking up away from the ball (both dominant and non-dominant hand)
7. Dribbling with the eyes closed to get a feel for the ball or dribbling using the blinders
8. Dribbling while walking
9. Dribbling with a slow jog
10. Speed dribble
11. Dribbling in one direction and then turning to another direction
12. Dribbling to a stationary obstacle and turning to another direction
13. Cross over dribble
14. Dribbling in and out around stationary objects
15. Dribbling in and out around stationary objects and keeping the body between the ball and obstacle
16. Dribbling against a defensive player

Dribbling Drills

1. File Dribble

Students are arranged in files, first player dribbles down to a specified point and returns, passes ball to next player in line. Drill continues until all players have had

their turn. Drill may be executed using dominant and non-dominant hand. This drill may be executed varying the speed with which players move.

2. Shuttle Dribble
   Divide the students into lines of four or five each on both ends of the court. First player in each line on one end of the court dribbles down to other end, hands ball off to first player in line and then goes to the end of the line. Drill continues until all players are back in original positions. Instead of handing ball off, you may incorporate different passes, or stop and pass.

3. Obstacle or Figure Eight Dribble
   Divide children into squads, set obstacles out and have children dribble in and out around the obstacles. Initially you may want to limit number of obstacles and set the obstacles farther apart. As children become more proficient, you may increase the number of obstacles and decrease the space between the obstacles.

4. Spoke or Circle Dribble
   Divide the children into squads of four or five. Have each squad form a circle, assign a number for each student. Place the ball in the center of the circle. When student's number is called, he/she retrieves the ball dribbles around the outside of the circle and back to place. You may also designate dominant or non-dominant hand for dribbling. All other children are seated in position.

5. Whistle Dribble
   Divide class into squads of about four or five players on one end of the court. The teacher stands in the center of the playing area. When the teacher blows the whistle, the first person on each team dribbles forward, when the whistle is blown again dribblers must stop. This continues until players are parallel to the teacher and then the player dribbles back to his team. Once the children have the idea, you may want to use hand signals for starting and stopping, this requires students to look up away from the ball.

6. Follow the Leader
   The teacher or student leader stands in front of the class. The leader may dribble forward, backward, sideways to the left or right, children try and mirror the leader's movements. Initially, you may want the leader to face the same direction as students then turn the leader to be face to face with students in the line.

Instructions for the Administration of the Control Dribble Skill Test

1. Three trials will be given. The first is a practice trial. The last two trials are recorded.

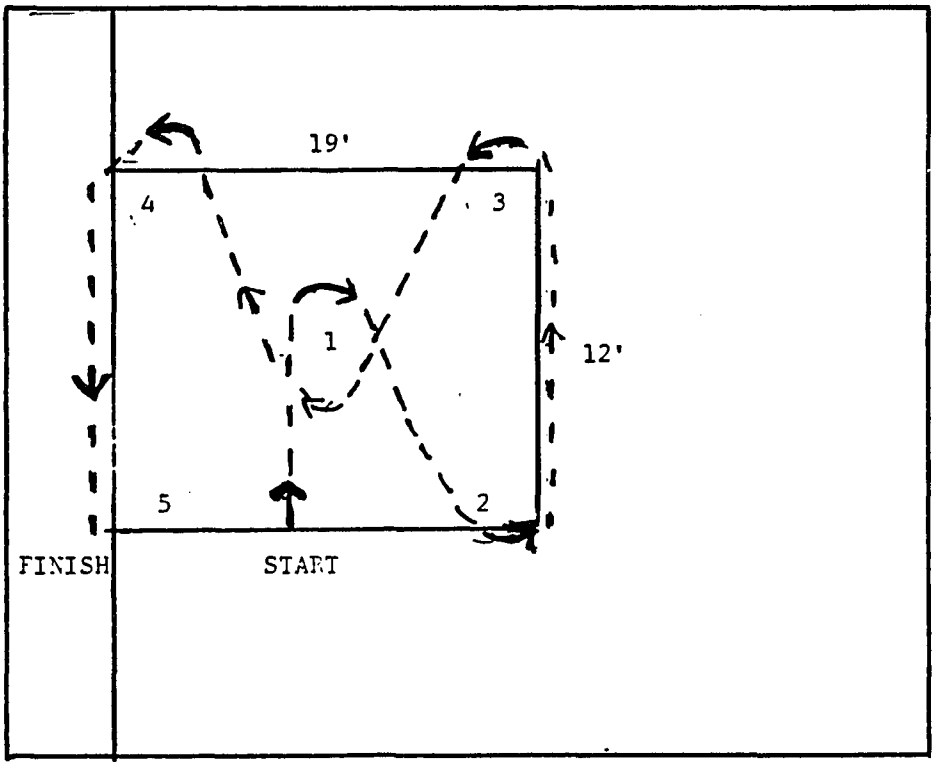
2. To begin each trial, the student starts at the starting cone, holding the ball in both hands. On the signal, "Ready, Go", the student dribbles the ball with the non-dominant hand to the side of cone 1. The student then proceeds to follow the course using the dominant hand and changing hands when deemed appropriate.

3. The trial is concluded when the student crosses the finish line with both feet.

4. Trials where ball handling infractions (traveling, double dribbling, loss of the ball) are made result in the trial being stopped and started again.

5. The score for each trial is the elapsed time required to complete the course. Scores will be recorded to the nearest tenth of a second for each trial and the final score will be the sum of the two trials.

DIAGRAM FOR THE CONTROL DRIBBLE SKILL TEST



CONTROL DRIBBLE SKILL TEST

SCHOOL_____
EXAMINER_____ _____

NAME	GENDER	HAND	P	1	2	T	P	1	2	T

Appendix D
Preactive Coding Form

PREACTIVE CODING FORM

SCHOOL_____ TAPE NUMBER_____ CODER_____

TASK/ACTIVITY DECISIONS	
STRUCTURE	
PROCEDURES	
FORMATIONS	
TIME	
TASK ADAPTATIONS	

SUBTOTAL_____

INSTRUCTIONAL PROCESS DECISIONS	
MANAGEMENT/MOTIVATION	
OBSERVATION/ASSESSMENT/ FEEDBACK	
DEMONSTRATIONS	
TRANSITIONS	
VERBAL INSTRUCTION	
STUDENT FOUCS	
EQUIPMENT	
INSTRUCTIONAL TIME	
OBJECTIVES	

SUBTOTAL_____

Appendix E
Preactive Planning Transcript

PREACTIVE PLANNING TAPE NUMBER 2

We'll call roll simply by calling out the partners and ask them if they remember--ask them who is missing. Check to make sure that Jennifer knows to go with LaTasha, as she was absent yesterday. If she is still absent, maybe LaTasha needs to have a partner and someone else can have full time on the ball for a change today.

And they'll face each other with their partner, and do their exercises as they did yesterday. That's ten leg lifts, with one partner with the ball, or there about. We won't count them. We'll just do them. And then we'll switch and the other partner will do leg lifts with the ball. The other partner will mirror each time what the partner with the ball was doing.

Then we'll do figure eights again, and switch the ball over to the other person again--and mirror when you don't have the ball. Then do the movement drill, with one partner in the front holding the ball, two rows of partners now. They'll face one way. And the leader, which in this case will be me, point hand right, left, forward, and backward like we did yesterday-- and they'll move a couple of times. And point out the fact that they need to be fast and agile. They need to have their athletic stance. I'll give them some cues on weight on the balls of their feet, are they slightly forward,... what else?

Let's have them switch the balls then and the other partner does the movement drill. Just holding the ball again. Not really dribbling. Then we'll go on and review athletic stance again, even though we talked about it in the movement drill. I'm going to ask them on cue to get in the athletic stance, and go over some points.

One partner will have the ball and one will... Let's see, are your hands up?--spread apart in case the ball they would need to hold the ball. Are their feet forward, weight forward, weight on the balls of the feet? o.k.

Then we'll go back to facing their partner. Let's switch balls on the stance and give the other person a chance to do the stance with the ball. Just switch after a while.

Alright. Number two. Let's go into dribbling with the dominant hand. And I've got two left handed boys. Let them go ahead and use their dominant hand, try to remember to let them use their dominant hand to get a good feel for the first dribble.

And spot check to see, in this case, that they are not slapping the ball, that they really are getting a feel for the

ball coming up off the ground. They're making an attempt to get that head up, and their athletic stance. And point out on their athletic stance, get your head up, chin up. On the exercise drill I'll be cueing.

Alright, let's have them dribble with their dominant hand and then we'll switch and have them do it with their non-dominant hand. Then we'll switch partners and have them dribble with their dominant hand and then their non-dominant hand. Then go down and give them some feedback on how good, or what their good points and what their weaker points are.

And I'll call out "Is your head up? Is your weight on the balls of your feet? Are your knees bent, body slightly forward? Where are your eyes? Are they straight on the ball or can you just get a feel for the ball and have the corner of your eye on the ball?"

Alright and then we'll go down to number three, which we thought we'd get to yesterday--and we haven't. The starting point our new things for them.

Alright. They're going to dribble around their partner. Partners will be about twenty feet apart. One partner will have the ball and dribble down, just with their dominant hand, down around the partner, no cross over with the ball, just straight dribbling with same hand. Go around with their right hand and back to space.

Bounce pass and the partner will dribble down around them and back to space--and they'll continue with the dominant hand. And I'll go down and give feedback and call out some cues such as--Is your head up? Is your body weight forward? Are you on the balls of your feet as you are running? Can you get a feel for the ball and then push it? Lot of wrist action. Get a feel for it rather than slapping at it and have to keep watching it. Do you push the ball ahead of you so you have room to run up to it or are you running over your ball and catching up to your ball every time? Do you have good control? Is the ball coming up to a good height? Are you having to crouch down to get it all the time? Can you make the ball come up to a good height with a lot of wrist action? That kind of thing.

O.K. and we'll do that, depending on how good they look and how much practicing, but mostly rather than go on quickly or to spend some time on that. Because I think it will keep their attention good. They're pretty active. So rather than go ahead too fast, let's let them really get a good overkill on that, rather than rush it and be sorry later because they can't catch on to a cross over because they're too busy looking at their ball. If they can't get their faces up and really get a good feel for that ball and push it. Number one. They're not going to be able to go on quickly later.

Alright. So let's spend a lot of time on this. Alright then we're going on to something that might turn out to be something wild--we'll see. It's a movement drill with the ball this time. One partner lines up on the line and the other partner just stands behind the line, out of the picture. Partners with the ball come up and we're just going to do the movement drill.

Leader holds out right arm. They try and dribble to the left, forward and back and take the ball with them. We're not going to talk about hands. We're just going to see if they can get the ball to go with them--and try not to look at the ball.

Again, athletic position and try to get the ball to go with them--just see if they can get a feel for the ball. Then we'll switch partners after a while and let the other partner do it. We'll do this quite a few times and see if we can get a really good drill in.

Talk about maybe feet at this point, isn't so much as seeing that the ball does what you want it do and goes in the direction that you want it to. Then if they're good in one particular direction, I'll direct them to get the feet going.

Alright. So we'll switch a few times on that. Then what I'd like to do and we'll be inside, it looks like rain. But we're going to try and see if there's enough room around. Half the people on one half of the court and they've got boundaries for that half. And the other kids on the other half of the court. The object being that your leader, your partner is going to run around the court, and you're going to try to follow whatever your partner does. And the partner is going to be warned not to run at right angles, make it too hard or reverse or anything. But see if you can, to some extent, number one: realize that there is something else--to keep your eye on the ball. There's somewhere else other than your ball to keep you eyes is what I'm trying to tell them. That you need to get up and be able to see players on the court, in this case, your partner. And you really have to follow. So get your head up, good body stance, good athletic stance, good dribble, get high enough, good push and get a feel for that ball, and be able to keep your eye on your partner rather than your ball.

Talk to partners about cooperation. Say "If you make it too hard and they can't do it, you're not helping your partner much. And the idea is to help each other so that you're the too best people in the class" kind of idea. Think that makes them cooperate with each other and gets them a skill level that goes along with capabilities at that point.

And then reverse, and let the other partner. If it's looks too crowded on half a court with, alright this will be how many people on half a court, fifteen people on half a court.

So that will kinda cramped with all the equipment in there. I might have to double back and say only seven at a time. But I'd like to give them more time on the ball. Maybe I'll divide the court into... it's too small to divide into quarter sections. We'll look at it and decide then. If I can get all fifteen people and balls, it will be that much better, but really going to have to see. We'll have to gear it for that.

Appendix F
Interactive Interview Questions

Interactive Interview Questions

1. What are you doing in this segment and why?

2. Were you thinking of any alternative actions or strategies at that time?

3. Did you have any particular objectives in mind during the segment? If so, what were they?

4. What were you noticing about the students?

5. How were the students responding?

6. Did any students' actions or reactions cause you to act differently than you had planned?

7. Do you remember thinking about any other aspects during this segment, such as time remaining in the lesson, or the time this segment required, or anything else that might have affected your decisions?

8. Do you remember having any off-task thoughts during this segment?

Appendix G
Interactive Coding Form

INTERACTIVE CODING INSTRUMENT

Information	Positive			Negative			Neutral		
Student Behavior Cues	Class	Group	Indiv.	Class	Group	Indiv.	Class	Group	Indiv.
Performance									
Involvement									
Interest									
Effort									
Verbalization									
Mood/Feeling									
Interactions									
Other									
Teacher/Context Cues									
Instructional Behavior									
Mood/Feeling									
Time									
Equipment/ Facility									

Coding Instrument Developed by L. Housner and D. Griffey

Appendix H
Interactive Recall Interview

RECALL INTERVIEW NUMBER TWO

SEGMENT 1

Q1TEACHER: Trying to get them to learn the footwork.

Q2TEACHER: I kept thinking why isn't my floor marked but that's part of the way that this is set up. So there was nothing that I could do to ... they're so used to floor marks or cones set up, it was hard to get them to spread out right.

Q3TEACHER: To learn the footwork.

Q4TEACHER: Some of them had the skill and some of them were just completely lost. And the kids were just watching the camera.

Q5TEACHER: Some of them just did it. I think they liked it; it was active enough for them but...

Q6TEACHER: Just the fact that they didn't catch on that quickly, the whole group ... it took a lot longer than planned.

Q7TEACHER: It was taking too long.

Q8TEACHER: The fact that they weren't understanding was kind of off task. It was taking time to say "how could I say this better so they'll catch on."

SEGMENT 2

Q1TEACHER: Trying to give some verbal cues and trying to get them to respond. Remember some verbal cues on athletic stance.

Q2TEACHER: The only thing I was worried about I was calling the same cues, I don't remember any.

Q3TEACHER: To get them to think about what they were doing, going to do right in the next few minutes--the correct technique.

Q4TEACHER: They were real eager to give me the right answer.

Q5TEACHER: The same people know the answers and the same ones don't.

Q6TEACHER: No.

Q7TEACHER: No. I knew this was going to take a few minutes.

Q8TEACHER: No.

SEGMENT 3

Q1TEACHER: Trying to get them to realize where the power came from in the dribble and get a feel for the ball and to actually start doing the stationary dribbling again.

Q2TEACHER: No.

Q3TEACHER: The same. To get them to start thinking about their dribbling and to start dribbling.

Q4TEACHER: Most of them were on task.

Q5TEACHER: They seemed to be understanding. Especially... I think we got better responses when we stay on it instead of going on and maybe losing them.--understanding the pushing, that we wanted the wrist and not too much of the arm.

Q6TEACHER: No.

Q7TEACHER: No.

Q8TEACHER: No.

SEGMENT 4

Q1TEACHER: Trying to go around and give feedback to the kids, stationary dribble with their dominant hand.

Q2TEACHER: No.

Q3TEACHER: To ... for me to see who needed help and reinforce who was doing it right.

Q4TEACHER: They were on task. Getting better. Some of them were still hitting, slapping at the ball, rather than getting a feel for it.

Q5TEACHER: They liked to dribble.

Q6TEACHER: No.

Q7TEACHER: No.

Q8TEACHER: No.

SEGMENT 5

Q1TEACHER: Going around and helping the ones who needed help. Spending a lot of time with the ones who needed help.

Q2TEACHER: No.

Q3TEACHER: To catch up the ones who needed help before we went on to moving with the dribble.

Q4TEACHER: They were on task, pretty much.

Q5TEACHER: Alright. They were on task.

Q6TEACHER: No.

Q7TEACHER: It always takes time to go around. So you just know it's going to take time.

Q8TEACHER: No.

SEGMENT 6

Q1TEACHER: We went on to trying to get them to get their eye off the ball by looking at their partners number that was being held up. so they would be able to look at the basket when they went to shoot.

Q2TEACHER: No.

Q3TEACHER: To get them to look up while they were dribbling stationary.

Q4TEACHER: They were on task, I think. The ones who were having trouble and going too fast were the same ones.

Q5TEACHER: They seemed to understand it and go on and do it.

Q6TEACHER: Well, I just planned to have to help the ones who needed help. If nobody needed help, I could go quicker. But it always get slowed down, if you're going to stop and help them.

Q7TEACHER: I thought we were going pretty good.

Q8TEACHER: No.

SEGMENT 7

Q1TEACHER: Giving feedback to the ones who were having a little trouble with their dribbling stationary, much less keeping their eye off the ball.

Q2TEACHER: I was really concerned that I was spending time with the ones who were having trouble and not getting around to general good feedback about who was doing it right.

Q3TEACHER: To get the ones who were having trouble to correct their technique.

Q4TEACHER: Most of them were.... they seemed to be.... I could hear numbers in the distance. I was paying attention to the general class but they seemed to be on task. So I could concentrate on the individuals.

Q5TEACHER: They seemed to like the idea... it was active enough. The partner had something to do too.

Q6TEACHER: No.

Q7TEACHER: No.

Q8TEACHER: No.

SEGMENT 8

Q1TEACHER: Going around and giving feedback on dribbling.

Q2TEACHER: No.

Q3TEACHER: To get some of the ones who were having trouble get a little better.

Q4TEACHER: Most of them seemed to be doing... It was getting a little long but I wanted to reach one more student or so.

Q5TEACHER: Towards the end it seemed like they were cutting up a little more. Maybe we should have stopped that drill and gone on to something different.

Q6TEACHER: No.

Q7TEACHER: I was that concerned that it was taking so long as it was, maybe time to change to something new .

Q8TEACHER: Yes. I had a teacher interrupt me.

SEGMENT 9

Q1TEACHER: We went to our non-dominant hand in the stationary dribble.

Q2TEACHER: No.

Q3TEACHER: To get them to use their non-dominant hand.

Q4TEACHER: They were confused, I guess, on aah, ... we had used fingers before. We were going back to the basics and just getting used to the feel of the ball first.

Q5TEACHER: They did it pretty well. Some of them were better, skill wise.

Q6TEACHER: When Caroline came up and interrupted me with Bryan, I had to stop and go back and say what I wanted, which was hands up with your partner and just do dribbling.

Q7TEACHER: No.

Q8TEACHER: Just that they were not following and we had to stop and start over, kind of thing.

INTERVIEWER: NOT FOLLOWING? CAN YOU BE MORE SPECIFIC?

TEACHER: I only wanted them to dribble with the non-dominant hand , they were trying to dribble with the non-dominant hand and count the fingers of their partner.

Appendix I

Additional Tables

Table I1. Means and Standard Deviations for Pre- and Post-Control Dribble Test for Girls

School	Pre-Test Mean	Standard Deviation	Post-Test Mean	Standard Deviation
1	32.16	5.22	26.18	2.83
2	25.65	4.43	23.85	3.38
3	33.34	8.96	28.64	4.28
4	25.91	3.97	24.37	3.20
5	28.98	3.93	24.77	2.63
6	30.43	4.66	28.68	1.15
7	27.0	3.89	24.02	2.10
8	27.18	5.04	24.04	5.48
9	26.87	3.35	23.78	2.77
10	28.44	4.33	24.62	2.44
11	30.56	4.13	24.96	3.57

Table I2. Means and Standard Deviations for Pre- and Post-Control Dribble Test for Boys

School	Pre-test Mean	Standard Deviation	Post-test Mean	Standard Deviation
1	22.31	2.60	21.30	5.52
2	20.48	1.58	18.64	1.78
3	20.66	2.88	19.98	2.29
4	20.92	2.37	20.30	2.56
5	22.37	3.14	21.49	1.78
6	24.09	2.35	22.88	2.35
7	22.92	4.67	22.70	4.32
8	20.66	2.88	19.98	2.29
9	22.73	4.17	20.69	2.85
10	22.85	3.84	22.07	2.36
11	23.07	5.08	19.19	2.70

Table I3. Stability Estimate for Instructional Unit

Source	df	SS	MS	F
School	10	32850.96	3285.09	19.74 **
Lessons	2	7556.06	3778.03	22.70 **
Error	20	3327.93		
Total	32	43734.95		

Table I4. Stability Estimate for Lessons 2 and 3 of the Instructional Unit

Source	df	SS	MS	F
Subjects	10	17706.00	1770.6	13.89**
Lessons	1	550.00	550.0	4.31
Error	10	1274.		
Total	21	19530.00		

$$R = \frac{MS_{subjects} - MS_{within}}{MS_{subjects}}$$

where

$$MS_{within} = \frac{SS_{subjects} + SS_{lessons}}{df_{subjects} + df_{lessons}}$$

$$MS_{within} = \frac{550 + 1274}{10 + 1} = \frac{1824}{11} = 165.8$$

$$R = \frac{1770.6 - 165.8}{1770.6} = \frac{1604.8}{1770.6} = .91$$

**$p < .01$

Table I5. Inter-Coder Reliability For the Preactive Coding Instrument.

Subcategory	Transcript					
	1	2	3	4	5	6
Structure	.92	.91	1.0	1.0	.88	.91
Procedures	.88	1.0	1.0	.93	.88	.85
Formations	.90	1.0	1.0	.90	.85	1.0
Time	1.0	1.0		1.0	1.0	1.0
Task Adaptations	1.0	1.0	1.0		1.0	
Management	1.0		1.0	1.0	1.0	1.0
Observation/ Assessment/ Feedback	1.0	1.0	1.0		1.0	1.0
Demonstration	1.0	1.0	1.0		1.0	
Transitions	1.0	1.0				

Table I5 continued

Student Focus	.86	.84	.88	.91	1.0	.88
Verbal Instruction	1.0	1.0	1.0	1.0	1.0	1.0
Equipment	1.0		1.0	1.0	1.0	
Objectives	1.0	1.0	1.0	1.0	1.0	1.0

Table I6. Inter-Coder Reliability For the Interactive Coding Instrument

Subcategory	Transcript					
	1	2	3	4	5	6
Performance	.94	.95	.92	.92	.91	.93
Involvement	1.0	1.0	.85	.92	.86	.88
Interest	1.0	1.0		1.0	1.0	1.0
Effort						1.0
Verbalizations		1.0		1.0		1.0
Mood/Feeling	1.0	1.0		1.0	1.0	
Interactions		1.0	1.0			1.0
Other						
Instructional Behavior	.89	.86	1.0	.90	1.0	.88

Table I6 continued

Teacher Mood/ Feeling	1.0		1.0	1.0		
Time	1.0	1.0	1.0	1.0	1.0	1.0
Equipment/ Facility			1.0	1.0	1.0	1.0

Table I7. ANOVA table of Pre-test for the Control Dribble Test

Source	df	SS	MS	F
Classes	10	60.41	6.04	1.52
Gender	1	185.25	185.25	46.75**
Error	10	39.62	3.96	
Total	21	285.29		

Vita

Deborah J. Howell was born July 2, 1951 in Little Rock, Arkansas. She attended Mount Saint Mary's Academy and graduated as a member of the 1969 graduating class. Deborah earned her undergraduate degree in physical education at the University of Southern Arkansas in 1973.

From May 1973 to 1974, she pursued a master of science in education degree at the University of Central Arkansas. In August 1974, she accepted a position as a secondary physical education teacher and coach of women's athletics in Waynesville, Missouri. From 1975 to 1977, she was employed as an elementary physical education specialist for the Russellville School district in Russellville, Arkansas.

In 1977, Deborah accepted a position as an instructor in the physical education department at the University of Central Arkansas and has remained on faculty there while pursuing her doctorate degree. In 1981, she took a leave of absence from her position at the University of Central Arkansas and entered the doctoral program at Louisiana State University. While completing the requirements for the doctorate degree, she was a teaching and research assistant in the School of Health, Physical Education, Recreation, and Dance. The doctorate of Philosophy was awarded in August 1987.

DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Deborah J. Howell

Major Field: HPERD (Professional Preparation)

Title of Dissertation: Planning and Interactive Decision Making in Expert Elementary Physical Education Teachers

Approved:

Amelia M. Lee
Major Professor and Chairman

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Date of Examination:

July 20, 1987